L 55935-65 EWT(d)/EWT(l)/EWP(m)/EWT(m)/EWP(w)/EWG(v)/EWA(d)/EWP(v)/EWP(k)/
FCS(k)/EWA(h)/EWA(c) Pd-1/Pe-5/Pf-4/Peb WW/EM

ACCESSION NR: AP5016262 UR/0258/65/005/003/0416/0424
533.6.011.55

AUTHOR: Gusev, V. N. (Moscow); Klimova, T. V. (Moscow); Korolev, A. S. (Moscow); Kryukova, S. G. (Moscow); Nikolayev, V. S. (Moscow)

TITLE: Hypersonic, viscous gas flows past sharp-nosed cones

SOURCE: Inzhenernyy zhurnal, v. 5, no. 3, 1965, 416-424

TOPIC TAGS: hypersonic flow, hypersonic viscous flow, hypersonic flow past cone, hypersonic similitude, real gas effect, drag, friction drag, boundary layer, hypersonic interaction parameter, boundary layer interaction

ABSTRACT: Hypersonic, viscous gas flows past slender sharp-nosed, thermally-insulated cones at arbitrary angles of attack are investigated. On the basis of the law of viscous hypersonic similitude, expressions are derived for pressure and local skin-friction coefficients, and for the drag acting on the body in the direction of flow. Two limiting cases are considered, that is, 1) when the relative thickness of the boundary layer δ is $\ll\theta$ (where θ is a thickness ratio), and 2) when $\delta \sim \theta$. In the first case, the friction drag is negligibly small as compared with the wave drag, but in the second case they are comparable. Thus,

Card 1/3 Submitted: 17 Jun 64

KOROLEV, A.S.

Determining the compression characteristics of clay soils and peat by the graphoanalytical method. Osn., fund. i mekh. grun. 7 no.6:26-28 '65. (MIRA 18:12)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824810014-3

KOROLEV, A. V.: Master Agric Sci (diss) -- "A study of a system of working fallow land on sod-podzolic soils using T. S. Mal'tsev's method". Leningrad, 1958. 26 pp (Min Agric USSR, Leningrad Agric Inst), 150 copies (KL, No 4, 1959, 129)

KOROLEV, A.V., kand.sel'skokhozyaystvennykh nauk

Follow less crop rotations and tillage. Zemledelie 24 no.10:6-8 O '62. (MIRA 15:11)

1. Dal'nevostochnyy nauchno-issledovatel'skiy institut sel'skogo khozyaystva.
(Khabarovsk Territory--Crop rotation)
(Khabarovsk Territory--Tillage)

KOROLEV, A.V.; KHAMRABAYEV, I.Kh., doktor geol.-min. nauk, glav. red.; BATALOV, A.B., kand.geol.-min. nauk, zam. glav. red. [deceased]; BAYMUKHAMEDOV, Kh.N., doktor geol.-min. nauk, red.; BYKOV, L.A., red.; GAR'KOVETS, V.G., red.; KHLOBUSTOV, A.A., kand. geol.-min. nauk, red.; TERNOVSKAYA, R.M., red.; GOR'KOVAYA, Z.P., tekhn. red.

[Select works] Izbrannye trudy. Tashkent, Izd-vo AN UzSSR. Vol.1. 1963. 499 p. (MIRA 16:12)

(Ore deposits)

KOROLEV, Aleksey Vasil'yevich, prof.; LUNEZHEVA, M.S., red.;
YAKUBOV, B.T., tekhn. red.

[Structure of ore zones and deposits] Struktury rudnykh polei i mestorozhdenii. Tashkent, Sredniaia i vysshaia shkola UzSSR, 1962. 186 p. (MIRA 16:7)
(Ore deposits)

KOROLEV, A.V.

Early history of metal working in Russia. Trudy po ist.tekh. no.7: 33-49 '54. (MLRA 7:7)
(Metalwork--History)

KOROLEV,A.V., kandidat tekhnicheskikh nauk, redaktor; DROZDOVSKAYA,I.S., redaktor; SHAPOVALOV,V.I., tekhnicheskiy redaktor

[Equipment and technology of forging and pressing industry; collection of articles from foreign scientific and technological periodical publications] Oborudovanie i tekhnologiia kuznechno-pressovogo proizvodstva; sbornik statei iz inostrannoi nauchno-tekhnicheskoi periodicheskoi literatury. Moskva, Izd-vo inostrannoi lit-ry, 1955. 278 p. (MLRA 9:3)

(Forging machinery)

KOROLEV, A.V.

PHASE I BOOK EXPLOITATION SOV/5013

Akademiya nauk SSSR. Institut mashinovedeniya

Issledovaniya v oblasti obrabotki metallov davleniyem (Investigations in the Field of Metal Pressworking) Moscow, Izd-vo AN SSSR, 1960. 66 p. Errata slip inserted. 4,200 copies printed.

Resp. Ed.: A.D.Tomlenov; Ed. of Publishing House: G.Ye. Puvmer; Tech. Ed.: S.P. Golub'.

PURPOSE: This collection of articles is intended for engineers, designers, and scientific research workers engaged in the plastic working of metals.

COVERAGE: Articles of the collection deal with the following problems: tensile stresses in metal during forging and cross-rolling; deformation of a membrane in bulging by hydraulic pressure; intensification of plastic deformation in stamping; contact area under the state of stress in helical cross-rolling on a three-roll mill; testing of sheet steel for biaxial tension by the method of bulging a membrane under hydraulic pressure; deformability of sheet steel; determination of the quality of industrial lubricants used in the cold stamping of sheet steel; determination of the quality of carbon sheet steel; and the temperature field of a blank in the hot stamping of steel plates. No personalities are mentioned. Each article contains conclusions based on investigations. References, predominantly Soviet, accompany most of the articles.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

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(2)

S/182/60/000/005/003/006
A161/A029

AUTHORS: Korolev, A.V.; Podluzhnaya, I.V.

TITLE: Technological Lubricants for Stamping Thin Sheet Steel

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 5, pp. 14 - 17

TEXT: More than 70 types of greases with different fillers were tested at the Laboratoriya obrabotki metallov davleniyem (Laboratory of Metalworking by Pressure) of the Institut mashinovedeniya AN USSR (Institute of Science of Machines of the AS USSR) on a plate device in a P-5 (R-5) test machine. Test plates coated with grease are moving downward between machine planks under 600 kg pressure and with a rate of 48 mm/min. The moving effort is fixed on a scale. The best result was obtained with gun grease per ГОСТ 3005-51 (GOST 3005-51). Once coated on the plates, it stayed on for five tests in a layer getting thinner (from 0.015 to 0.01 mm) in the beginning, and becoming stable afterwards (thinning is explained by squeezing out). The fillers tested were highly dispersed powders and laminar fillers, e.g., powdered aluminum, oxides of iron, chromium and nickel, chalk and starch. Talc was used as laminar filler. Two greases used in the press shop of Avtozavod im. Likhacheva (Automobile Works im. Likhachev) were also tested.

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KOROLEV, A.V.

PHASE I BOOK EXPLOITATION SOV/4961

Akademiya nauk SSSR. Institut mashinovedeniya

Tekhnologicheskiy smazki dlya obrabotki metallov davleniyem (Industrial Lubricants Used in Pressworking of Metals) Moscow, Mashgiz, 1960. 96 p. 5,000 copies printed.

Sponsoring Agency: Institut mashinovedeniya Akademii nauk SSSR.

Ed.: A. V. Korolev, Candidate of Technical Sciences; Ed. of Publishing House: G. N. Soboleva; Tech. Ed.: L. P. Gordeyeva; Managing Ed. for Literature on Heavy Machine Building: S. Ya. Golovin, Engineer.

PURPOSE: This collection of articles is intended for scientific and technical personnel, production engineers, and students in schools of higher technical education and tekhnikums.

COVERAGE: The book contains articles analyzing the research on industrial lubricants used in pressworking of metals conducted by various institutes and plant laboratories. It is stated that these lubricants improve the metal-forming process and increase the wear resistance of tools (dies), thereby

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S/137/61/000/001/009/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1961, No. 1, p. 17, # 1D156

AUTHOR: Korolev, A.V.

TITLE: On the Problem of Testing Technological Lubricants Used in Cold Press Forming of Thin Sheet Steel

PERIODICAL: V sb. "Tekhnol. smazki dlya obrabotki metallov davleniyem", Moscow, Mashgiz, 1960, pp. 15 - 23

TEXT: To determine technological properties of lubricants, IMASh AS USSR developed a press forming device and a tabular device which are described. Using these machines it was established that in cold press-forming consistent lubricants should be used with fillers, such as solid oil, vaseline, gun oil with addition of (> 40%) talcum.

V. B.

Translator's note: This is the full translation of the original Russian abstract.

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S/182/60/000/007/010/016
A162/A029

AUTHOR: Korolev, A.V.

TITLE: Conference on the Development of Modern Processes of Working Metals by Pressure III

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 7, p. 49

TEXT: The Komissiya po tekhnologii mashinostroyeniya pri institute mashinovedeniya AN SSSR (Commision on Technology of Machine Building at the Institute of Machine Science of the AS USSR) has decided to carry out a co-ordinate conference on the new processes of metal working by pressure in the IV quarter of 1960 at the above-mentioned Institute. The following reports will be made: P.N. Bidulya, Doctor of Technical Sciences, and N.P. Gromov, Candidate of Technical Sciences of the Moskovskiy vecherniy metallurgicheskiy institut (Moscow Metallurgical Evening Institute) on pressing of liquid steel under great pressure, and K.N. Smirnova, Engineer of the Mytishchinskiy mashinostroitel'nyy zavod (Mytishchi Machine Building Plant) on pressing of steel during the crystallization period. L.D. Gol'man, Candidate of Technical Sciences, and D.P. Prokhorov, Engineer, both working at the Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskogo mashinostroyeniya (All-Union Scientific-Research Institute

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Conference on the Development of Modern Processes of Working Metals by Pressure

of Metallurgical Machine Building) will report on results of works on application of ultra-high pressures for plastic deformations of metals. M.Ya. Karnov, Engineer (Moscow), on peculiarities of plastic deformation under conditions of vibratory loading. A.I. Tselikov, Corresponding Member of the AS USSR and the engineers V.M. Lugovskiy and Ye.M. Tret'yakov, all three working at the Laboratoriya obrabotki metallov davleniyem Instituta mashinovedeniya AN SSSR (Laboratory of Metal Working by Pressure of the Institute of Machine Science of the AS USSR) on the development of processes of cross-screw rolling for the production of machine parts. A.D. Tomlenov, Doctor of Technical Sciences (Institute of Machine Science of the AS USSR) on the processes of cold stamping. V.A. Popov, Candidate of Technical Sciences (Eksperimental'nyy nauchno-issledovatel'skiy institut kuznechnogo mashinostroyeniya (Experimental Scientific-Research Institute of Forging Machine Building, Voronezh) on progress in cold extrusion work. A.A. Rubenkova, Candidate of Technical Sciences, and B.A. Shcheglov, Engineer, both workers of the Institute of Machine Science of the AS USSR, on evaluation of steel stamping by the method of two-axial expansion and on steel stamping in conditions of high-speed deformation. Yu.P. Kazakov, Engineer, (Mosstankin) and V.V. Serep'yev, Engineer (Avtozavod imeni Likhacheva (Automobile Plant imeni Likhachev), on the

Conference on the Development of Modern Processes of Working Metals by Pressure

the AS USSR), on technological lubricants under conditions of plastic deformation. V.I. Yakimovskiy, Candidate of Technical Sciences (NIIavtoprom), on a new method of hot rolling of spiral-conical automobile and tractor wheels.

S/182/61/000/004/007/007
D038/D112

AUTHOR: Korolev, A.V.

TITLE: Conference on new technological processes of metal working by pressure in machine building

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 4, 1961, 46-48

TEXT: The Komissiya po tekhnologii mashinostroyeniya pri Institute mashinovedeniya AN SSSR (Commission for the Technology of Machine Building at the Institute of the Science of Machines of the AS USSR) organized a soveshchaniye po novym tekhnologicheskim protsessam obrabotki metallov davleniyem v mashinostroyenii (Conference on New Technological Processes of Metal Working by Pressure in Machine Building) in Moscow between December 13-15, 1960, in which representatives from academic, industrial, and educational institutes, and workers from plants in Moscow, Leningrad, Sverdlovsk, Novosibirsk, the Urals and other important industrial centers took part. Papers were read by the following: M.Ya. Karnov, Engineer, on "The peculiarities of plastic deformation under vibration load conditions"; A.D. Tomlenov, Doctor of Technical Sciences of the IMASh of the AS USSR, on "The theory of hydrodynamic testing of sheet metal"; B.A. Shcheglov, Engineer, on "The stampability of sheet steel under conditions of high speed deformation", which was tested at the Institute

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S/182/61/000/004/007/007
D038/D112

of the Science of Machines of the AS USSR; L.A. Rubenkova, Candidate of Technical Sciences of the IMASh, AS USSR, and Yu.P. Kazakov, Engineer (Mosstankin), on "The investigation on the deformed and stressed state in thin sheet metal parts of complex shape during extrusion". The following delegates also spoke: A.I. Tselikov, Corresponding Member of the AS USSR, on the prospects of developing transverse helical rolling, and its application in the production of machine building components; V.P. Severdenko, Academician, and L.I. Fedorov, Candidate of Technical Sciences of the Fiziko-tekhnicheskiy institut AN BSSR (Physicotechnical Institute of the AS BSSR) on a successful experiment in which step shafts were produced by transverse helical rolling accompanied by simultaneous electric contact heating of the deformation spot; E.R. Shor on the present state and prospects of producing section and sheet steel of varying cross-section by varying the distance between the roll axes; V.A. Spitsyn, Engineer from the zavod "Frezer" ("Frezer" Plant), on a longitudinal-helical rolling mill for 2-10 mm spiral drills designed at his plant; B.S. Azarenko, Candidate of Technical Sciences from the MVTU im. Baumana (MVTU im. Bauman), on an experimental-industrial МВТУ-5 (MVTU-5) caterpillar-type prototype of a continuous drawing mill for drawing seamless and welded steel and non-ferrous pipes, and for drawing and calibrating rods; Ye.I. Isachenkov, Candidate of Technical Sciences, on progressive methods of step-by-step stamping of sylphon-type radially corrugated tubes, in the development of which O.V. Shalygina took part; P.N. Bidulya, Professor of the Moskovskiy vecherniy

mashinostroitel'nyy institut (Moscow Night Institute of Machine Building), on pressing of molten steel under high pressure; K.N. Smirnova, Engineer, on the results of examinations of the crystallization phase in steel during pressing which were carried out at the Mytishchinskiy mashinostroitel'nyy zavod (Mytishchi Machine Building Plant); A.V. Stepanov, Doctor of Technical Sciences of the Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physicotechnical Institute of the AS USSR), on a new method of manufacturing items directly from the smelt; A.S. Nikiforov, Engineer, of the zavod imeni 1-go Maya Kalininskogo sovnarkhoza (Plant "imeni Pervoye Maya" of the Kalininskiy Sovnarkhoz) on a unit consisting of a continuous steel teeming machine and a transverse helical rolling mill developed at his plant; N.P. Ageyev, Candidate of Technical Sciences of the kafedra obrabotki metallov davleniyem Leningradskogo voyenno-mekhanicheskogo instituta (Department of Metal Working by Pressure of the Leningrad Military-Engineering Institute) on the development and production of a 500 kg-maximum load-testing machine; A.D. Assonov, Candidate of Technical Sciences, Chief Metallurgist of the Avtozavod im. Likhacheva (Automobile Plant im. Likhachev), on high-temperature heating of metal during stamping; M.G. Lozinskiy, Doctor of Technical Sciences of the IMASh of the AS USSR, on increasing the strength of martensitic and austenitic steel grades by combining high-temperature deformation with hardening; P.A. Ivanov, Engineer of the IMASh of the AS USSR, with V.T. Chirikov, on the development of a new techno-

Conference on new ....

S/182/61/000/004/007/007
D038/D112

logy for manufacturing piston-pin-type parts by a combined method of carburizing and hot extruding; E.Z. Klurfel'd, Engineer, on an experiment, carried out at the Altayskiy traktornyy zavod (Altay Tractor Plant), on the application of forging heat for heat treatment of stamped blanks; Yu.M. Rudnev and A.M. Rumyantsev on semi-automatic batch stamping of parts in small series production; V.A. Popov, Candidate of Technical Sciences, of the ENIMKMASh, on progressive methods of producing reinforcing components by cold extrusion; V.V. Shevelev, Engineer, of the Tul'skiy mekhanicheskiy institut (Tula Mechanical Engineering Institute), on the results of work carried out to determine the stresses and degree of deformation in the combined processes of sheet stamping; A.Kh. Grikke and Ye.I. Demidenko, staff members of the Institut mashinovedeniya Latviyskoy SSR (Institute of the Science of Machines of the Latviyskaya SSR), on an investigation of high-speed cold stamping on an automatic feed press; Ye.A. Popov, Doctor of Technical Sciences of the MVTU im. Bauman, on the possibility and expediency of replacing sheet blanks by skelps in the production of certain parts, with a resulting economy in metal; V.P. Romanovskiy, Candidate of Technical Sciences (Leningrad), on a new method of stamping out thin-sheet parts by highly-ductile metal dies; I.M. Kirmos, Engineer, on a new method of cutting out small thin-sheet metal parts without dies, i.e. by pressing the sheet by a cutting die into a sheet of softer metal; V.A. Zhavoronkov, Candidate of Technical Sciences of the MVTU im. Bauman, on a continuous method of pro-

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Conference on new ....

ducing shapes from laminated plastics. The delegates were informed on a new device for pipe extrusion developed by V.Ya. Mil'chevskiy, Engineer of the Nauchno-issledovatel'skiy proyektno-tekhnologicheskiy institut mashinostroyeniya (Scientific Research Design and Planning Technological Institute of Machine Building) at Kramatorsk and introduced under the supervision of N.M. Zolotukhin, Candidate of Technical Sciences, at the Novo-Kramatorskiy mashinostroitel'nyy zavod (Novo-Kramatorsk Machine Building Plant). The Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskogo mashinostroyeniya (All-Union Scientific Research Institute of Metallurgical Machine Building) developed and realized a method of producing sheet metal of variable cross-section on a special mill; the method is said to be 40-50 times more productive than those using metal-cutting machines. An installation developing a pressure of 10,000 kg/cm^2 was created in the Institut fiziki sverkhvysokikh davleniy AN SSSR (Institute of the Physics of Superhigh Pressures at the AS USSR) for hydraulic pressing. The conference adopted resolutions calling for an early introduction of new methods of working metals by pressure and better coordination of research work; it requested the Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu (State Committee of the Council of Ministers of the USSR for Automation and Machine Building) to make the VNIIMETMASh (for rolling, drawing and pressing) and the ENIIKMASh (for forging, stamping, and heating of metal) responsible for the co-ordination of scientific research,

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D038/D112

Conference on new ....

design and experimental work on cold and hot working of metals by pressure. There is 1 figure.

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S/030/61/000/003/013/013
B105/B215

AUTHOR: Korolev, A.V.

TITLE: New technological methods in machine building

PERIODICAL: Vestnik Akademii nauk SSSR, no. 3, 1961, 128 - 130

TEXT: This is a report on a conference convened by the Komissiya po tekhnologii mashinostroyeniya (Commission for the Technology of Machine Building) at the Institut mashinovedeniya Akademii nauk SSSR (Institute of Science of Machines of the Academy of Sciences USSR) from December 13, to 15, 1960. Besides scientific collaborators, also members of the staff of a number of large machine works of the country participated. It was the task of the conference to generalize the results obtained, to coordinate further theoretical and experimental studies and practically apply the methods developed as quickly as possible. 38 reports on modern methods of processing metals by pressure were given and discussed at the conference. One of these methods is cross thread rolling. Methods of rolling balls of 25 to 125 mm also have been worked out. The following reports are men-

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tioned: A.I. Tselikov on cross rolling of cylindrical and conical driving wheels, various bushings and rings; V.P. Severdenko and L.I. Fedorov: on the production of stepped shafts by the Fiziko-tekhnicheskiy institut Akademii nauk Belorusskoy SSR (Physicotechnical Institute of the Academy of Sciences Belorusskaya SSR); V.A. Spitsyn: on zavod "Frezer" (Works "Frezer") where a rolling mill for longitudinal thread rolling was built for the production of 2 - 10 mm drills; B.S. Azarenko: on a draw bench type МВТУ-5 (MVTU-5) for the production of seamless and welded tubes of the Moskovskoye vyssheye tekhnicheskoye uchilishche im. Baumana(Moscow School of Higher Technical Learning imeni Bauman); N.M. Zolotukhin and V.Ya. Mil'gevskiy on the continuous production of borehole tubes in the Novo--Kramatorskiy zavod (Novo-Kramatorsk Works); Ye.I. Isachenkov on punching of radial crimped tubes. Furthermore, reports were given on the erection of units and development of technological methods of immediate pressing and rolling of liquid metal. The utilization coefficient of liquid metal thus is 0.8 - 0.95, for rolling it is 0.32, and for forging 0.47 ((according to data of the GNTK, Gosudarstvennyy nauchno-tekhnicheskiy Komitet (State Scientific Technical Committee) for 1959)). The strength of pressed steel products thus is 1.15 - 1.2 times the strength of rolled

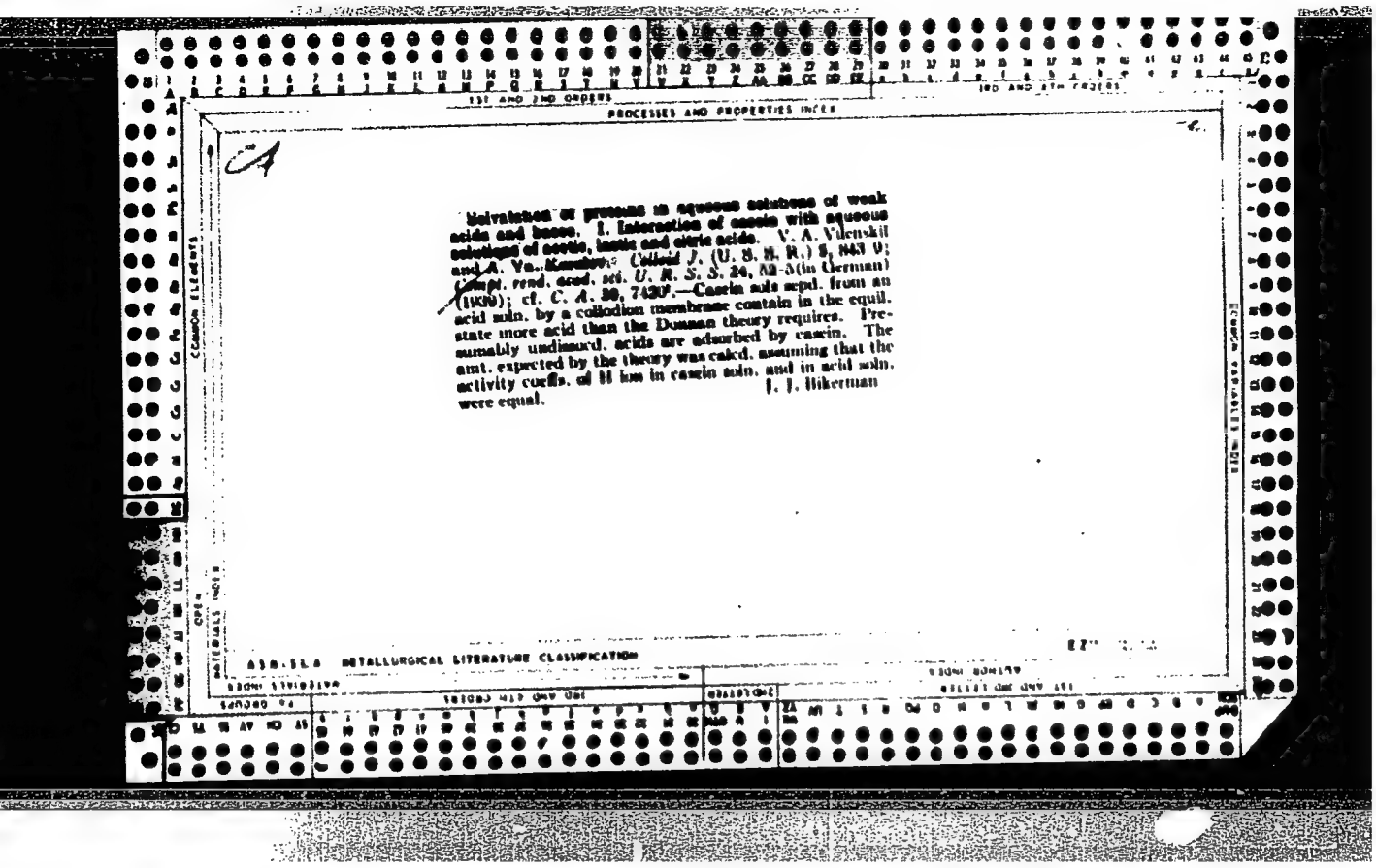
products. P.I. Bidulya reported on rolling liquid steels at high pressure in the Mytishchinskiy mashinostroitel'nyy zavod (Mytshchi Machine Works); K.N. Smirnova: on the examination of the crystallization period of steel during this process; A.V. Stepanov on a simpler method worked out by the Fizikotekhnicheskiy institut Akademii nauk SSSR (Physicotechnical Institute of the Academy of Sciences USSR). A.S. Nikiforov on an aggregate made of a machine for continuous steel casting and a cross thread rolling mill for the production of steel balls in the zavod im. 1 Maya Kalininskogo sovnarkhoza (Works imeni May 1, of the Kalinin sovnarkhoz). A unit warranting pressures of 10,000 kg/cm^2 was built in the Institut fiziki vysokikh davleniy Akademii nauk SSSR (Institute of Physics of High Pressures of the Academy of Sciences USSR) for the realization of the method of hydraulic pressing. Heating of carburized and alloy steel of up to 1250° C was applied in the Moskovskiy avtozavod im. Likhacheva (Moscow Car Works imeni Likhachev) where heat was utilized for metal deformation and also for isothermal hardening of the punched part. The Institute of Science of Machines of the Academy of Sciences USSR succeeded in increasing the strength of martensite-austenite steels by a combination of plastic de-

New technological methods in ...

forming and hardening. E.E. Klurfel'd reported on the utilization of forging heat for the thermal treatment in the Altayskiy traktornyy zavod (Altay Tractor Works); A.D. Tomlenov on practical test methods; B.A. Shcheglov on quick deformation of sheet metal; L.A. Rubenkova examined the stretched and deformed state in drawing complicated forms of thin sheet metal; A.Kh. Grikke, and Ye.I. Demidenko studied cold quick punching in a press with automatic stock feed in the Institut mashinovedeniya Akademii nauk Latviyskoy SSR (Institute of Science of Machines of the Academy of Sciences Latviyskaya SSSR); V.A. Zhavoronkov discussed the method of the continuous production of profiles of multi-layered plastics. Measures for introducing new and fast methods of metal processing by pressure were outlined at the conference.

KOROLEV, Aleksey Vasil'yevich; SHEKHTMAN, Pavel Aleksandrovich; VOL'FSON, F.I., retsenzent; YERMAKOV, N.P., red.; SMIRNOVA, Z.A., ved. red.

[Structural conditions governing the distribution of postmagmatic ores] Strukturnye usloviia razmeshcheniia poslemagmaticheskikh rud. Moskva, Nedra, 1965. 506 p. (MIRA 18:4)

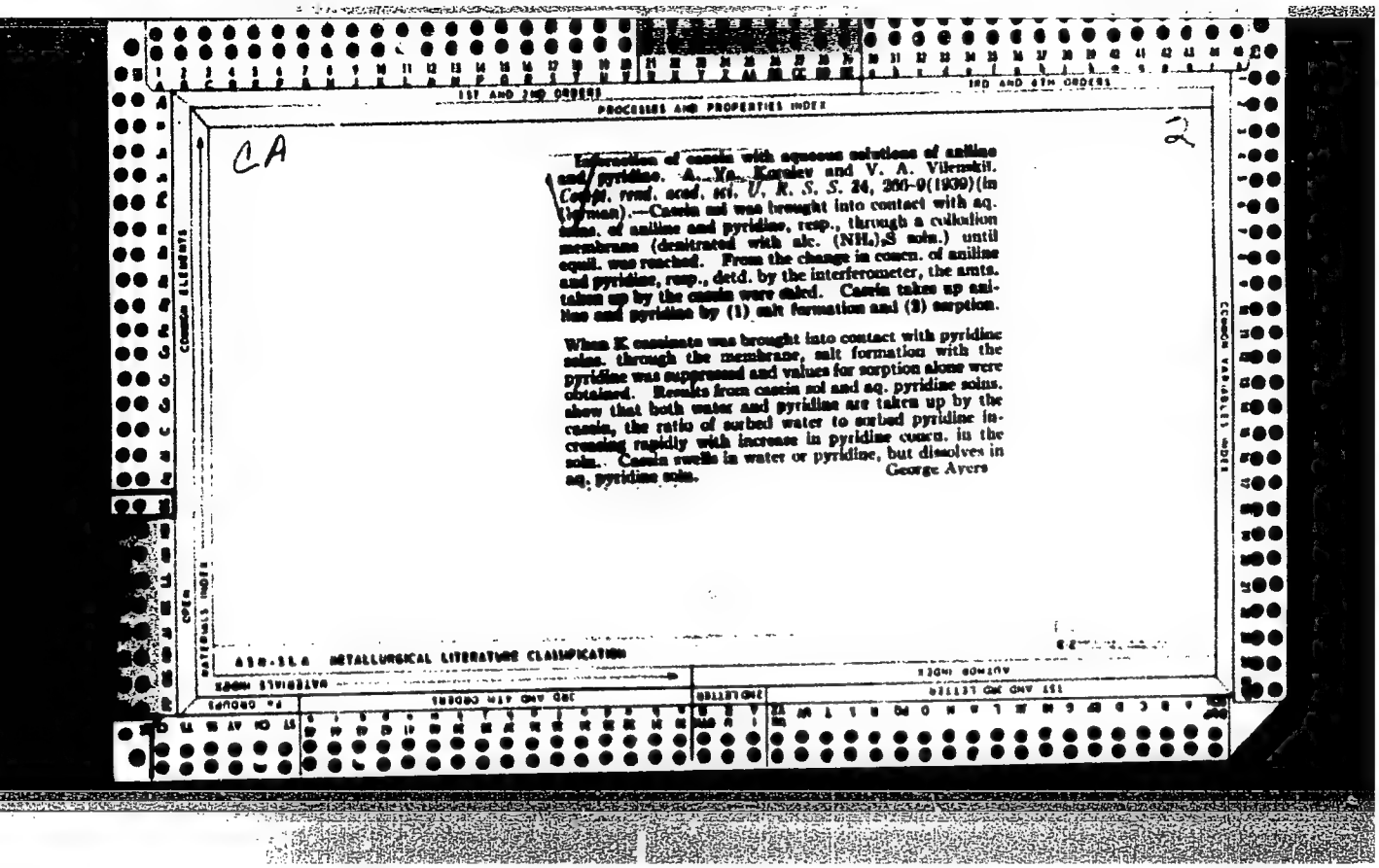


PROCESSES AND PROPERTIES INDEX

C1

Solvation of proteins in aqueous solutions of weak acids and bases. I. Interaction of casein with aqueous solutions of acetic, lactic and citric acids. V. A. Vilenskii and A. Ya. Kamenev. *Colloid J.* (U. S. S. R.) 5, 843 V; *Compt. rend. acad. sci. U. R. S. S.* 24, No. 5 (in German) (1939); cf. *C. A.* 33, 7430.—Casein soln. separd. from an acid soln. by a collodion membrane contain in the equil. state more acid than the Donnan theory requires. Presumably undissocd. acids are adsorbed by casein. The amt. expected by the theory was calcd. assuming that the activity coeffs. of H ion in casein soln. and in acid soln. were equal. J. J. Bikerman

A38-11A METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

CA

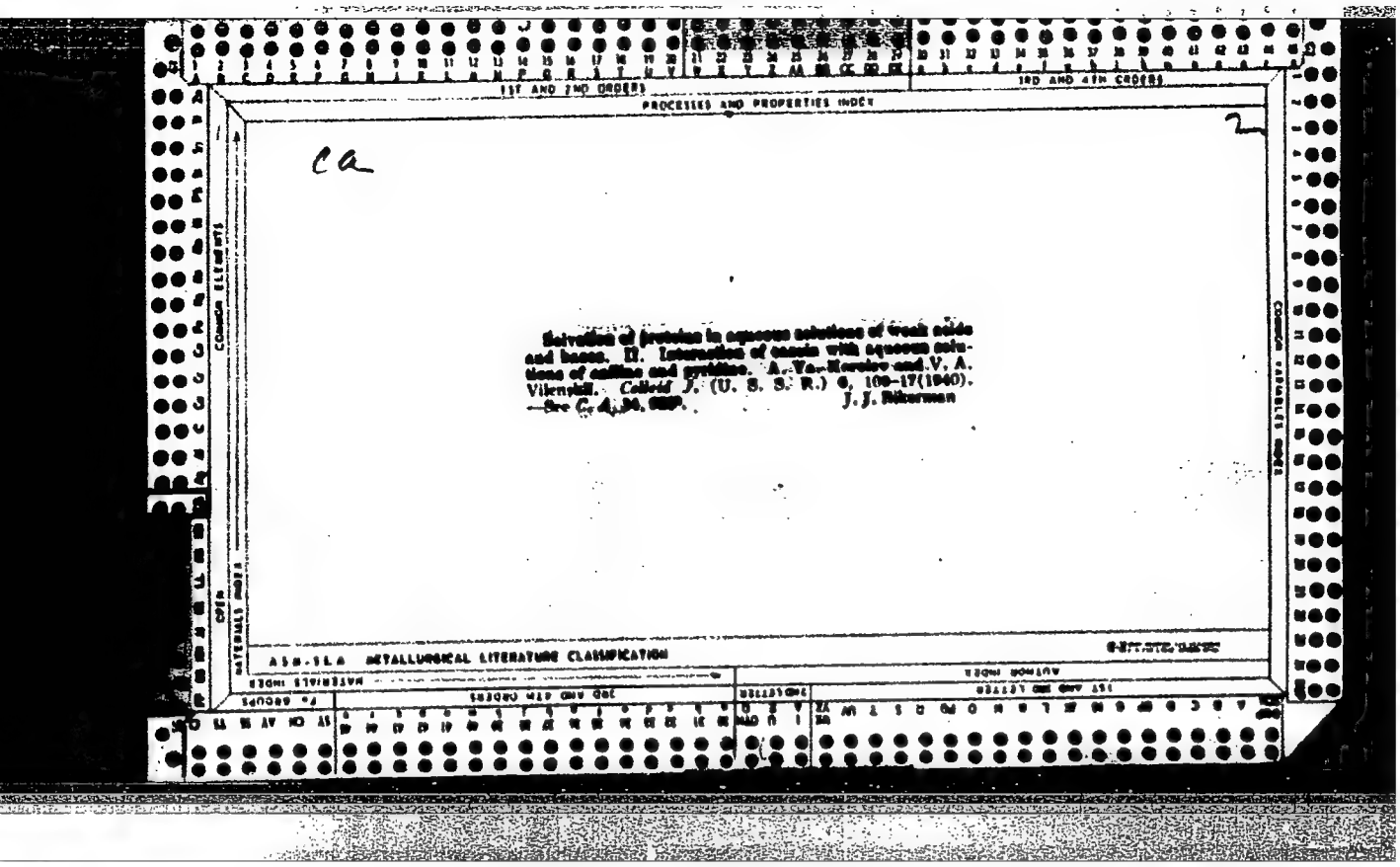
2

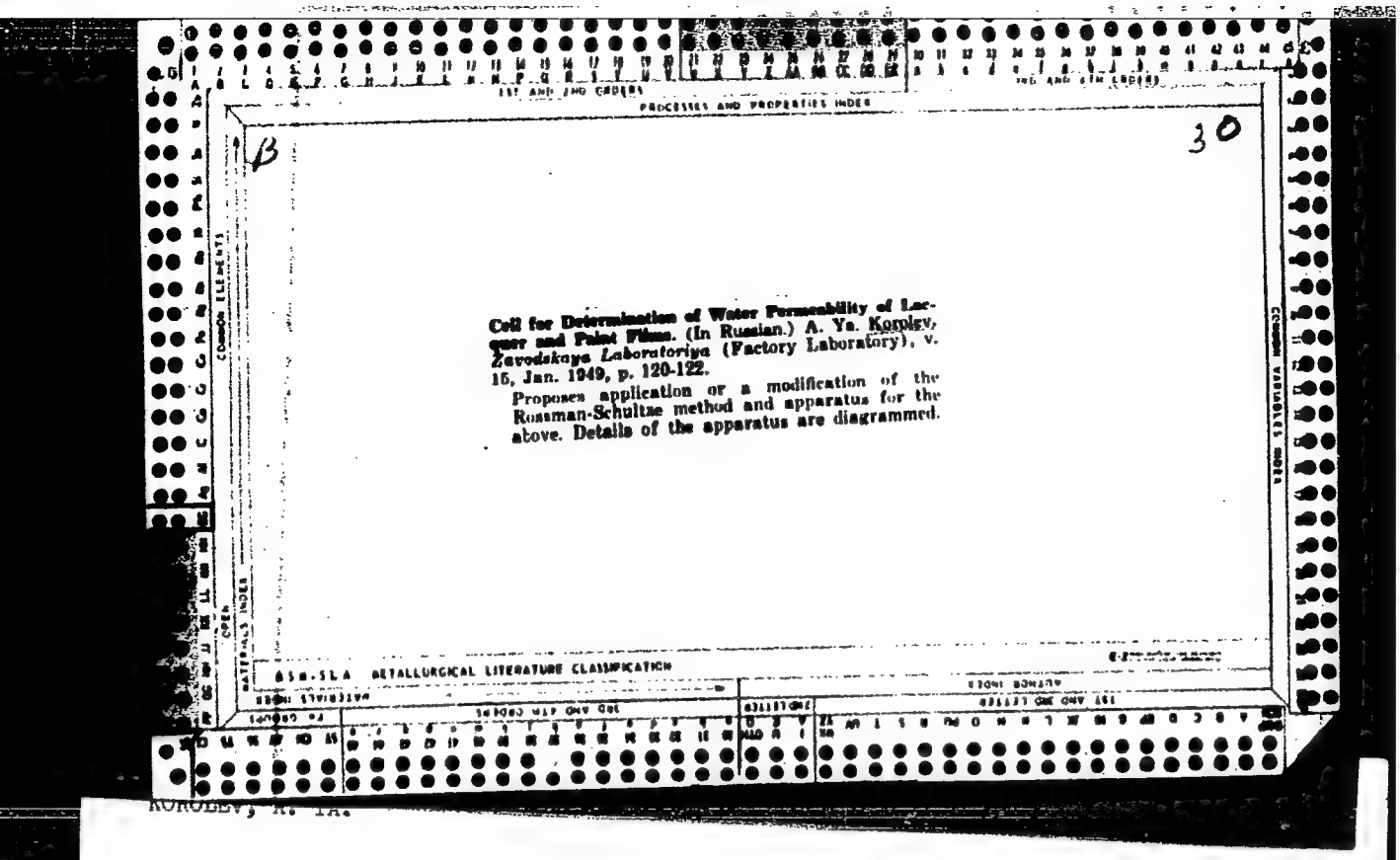
Interaction of casein with aqueous solutions of aniline and pyridine. A. Ya. Korolev and V. A. Vilenskii. *Compt. rend. acad. sci. U. R. S. S.* 24, 260-0(1939)(in German).—Casein sol was brought into contact with aq. solns. of aniline and pyridine, resp., through a collodion membrane (dehitrated with alc. $(NH_4)_2S$ soln.) until equil. was reached. From the change in concn. of aniline and pyridine, resp., detd. by the interferometer, the amts. taken up by the casein were calcd. Casein takes up aniline and pyridine by (1) salt formation and (2) sorption.

When K caseinate was brought into contact with pyridine solns. through the membrane, salt formation with the pyridine was suppressed and values for sorption alone were obtained. Results from casein sol and aq. pyridine solns. show that both water and pyridine are taken up by the casein, the ratio of sorbed water to sorbed pyridine increasing rapidly with increase in pyridine concn. in the soln. Casein swells in water or pyridine, but dissolves in aq. pyridine solns.

George Ayers

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION





PROCESSES AND PROPERTIES INDEX

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B

Coil for Determination of Water Permeability of Lacquer and Paint Films. (In Russian.) A. Ya. Korolev, *Zavodskaya Laboratoriya* (Factory Laboratory), v. 15, Jan. 1949, p. 120-122.

Proposes application or a modification of the Rossman-Schultze method and apparatus for the above. Details of the apparatus are diagrammed.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KOROLEV, A. YA.

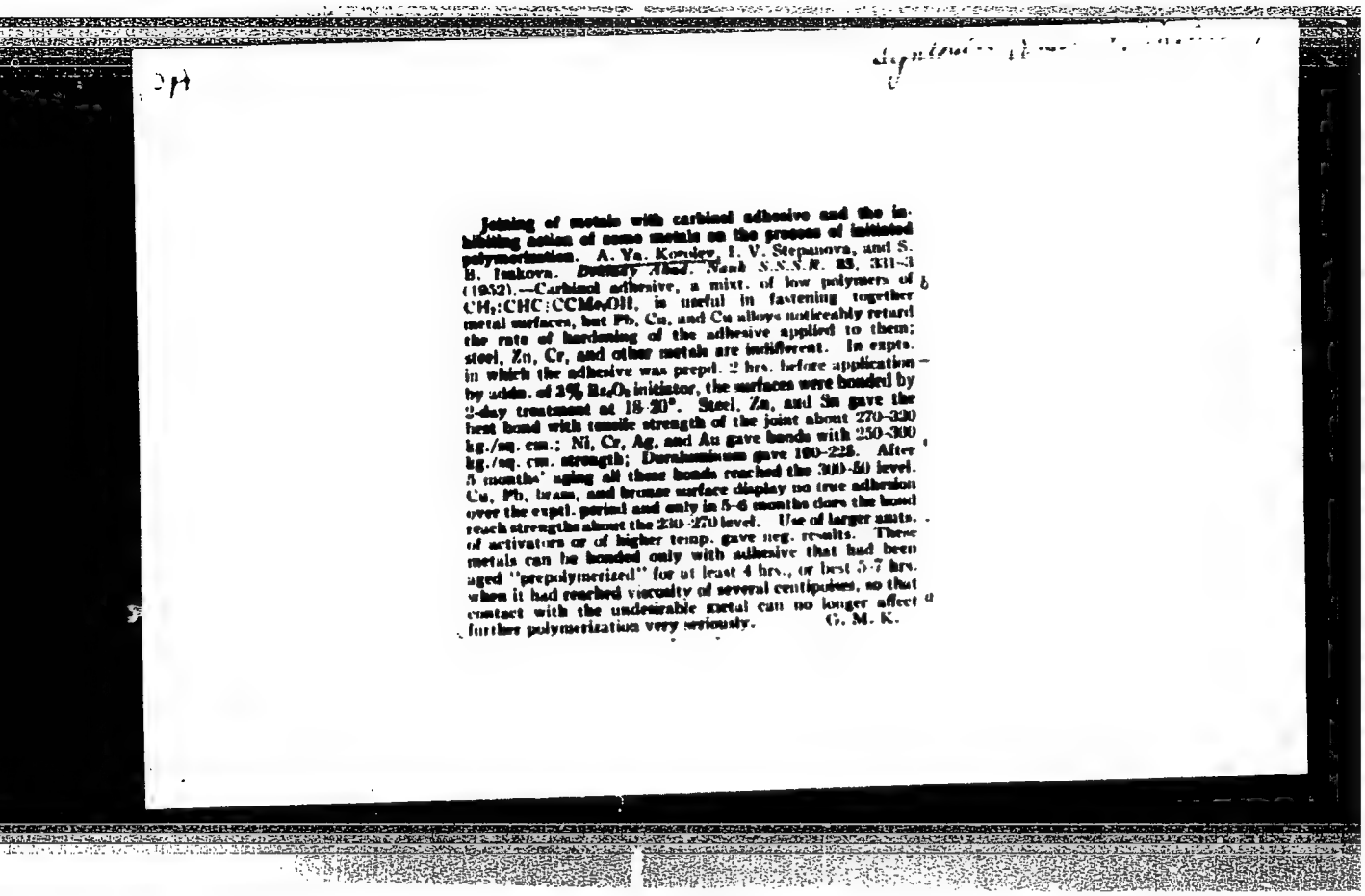
USSR/Chemistry - Polymerization 1 Jul 52

"The Polymerization of Drying Oils Under Vacuum,"
A. Ya. Korolev, N. I. Leonova

"Dok Ak Nauk SSSR" Vol LXXXV, No 1, pp 99-102

The vacuum polymerization of flaxseed oil was studied at pressures of 1-760 mm. Below 100 mm the amt of volatile matter is highest and the acid number lowest. From 100 to 740 mm, these 2 values are almost const. This was also confirmed with perilla oil. Presented by Acad A. V. Topchiyev 26 Apr 52.

224T13



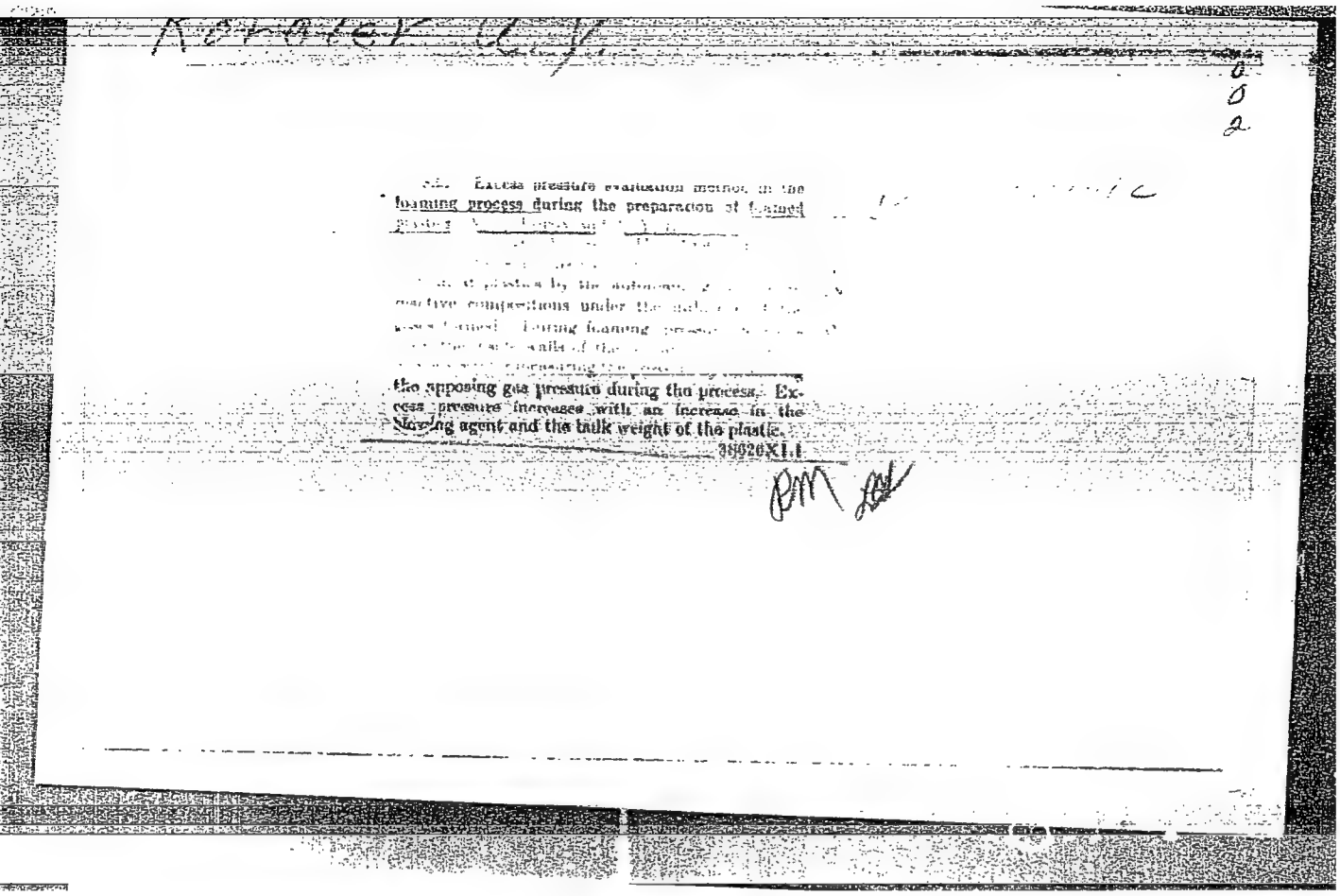
Joining of metals with carbinol adhesive and the inhibiting action of some metals on the process of initiated polymerization. A. Ya. Kovalev, I. V. Stepanova, and S. B. Ivakova. *Doklady Akad. Nauk S.S.S.R.* 83, 331-3 (1952).—Carbinol adhesive, a mixt. of low polymers of $CH_2:CHC:CCH_2OH$, is useful in fastening together metal surfaces, but Pb, Cu, and Cu alloys noticeably retard the rate of hardening of the adhesive applied to them; steel, Zn, Cr, and other metals are indifferent. In expts. in which the adhesive was prepd. 2 hrs. before application by addn. of 3% Bz_2O_2 initiator, the surfaces were bonded by 2-day treatment at 18-20°. Steel, Zn, and Sn gave the best bond with tensile strength of the joint about 270-330 kg./sq. cm.; Ni, Cr, Ag, and Au gave bonds with 230-300 kg./sq. cm. strength; Duralumin gave 190-225. After 5 months' aging all these bonds reached the 300-50 level. Cu, Pb, brass, and bronze surface display no true adhesion over the expt. period and only in 5-6 months does the bond reach strengths about the 230-270 level. Use of larger amts. of activators or of higher temp. gave neg. results. These metals can be bonded only with adhesive that had been aged "prepolymerized" for at least 4 hrs., or best 5-7 hrs. when it had reached viscosity of several centipoises, so that contact with the undesirable metal can no longer affect further polymerization very seriously. G. M. K.

Koroley, A. Ya.

62 **Molecular weight and intrinsic viscosity of polydimethylsiloxane fractions.** A. Ya. Koroley, K. A. Andrianov, L. S. Utesheva, and T. E. Vvedenskaya. *Doklady Akad. Nauk S.S.S.R.* 89, 65–8(1953).—A sample of $(SiMe_2O)_n$, d_4^{25} 0.9750, n_D^{25} 1.4025, was fractionated by pptn. from 1% and then 0.5% C_6H_6 soln. at 25 ± 0.02° with MeOH. The osmotic pressures were detd. in toluene by using a denitrated nitrocellulose membrane. The mol. wt. (M), consts. μ and K, and the intrinsic viscosity ($[\eta]$) were calcd. by using the equations of Huggins (*C.A.* 36, 5407⁵; 37, 19⁸): $(\pi/c_2) - (RTD_1c_2^2/3M_1d_2^2) = (RT/M_2) + (RTD_1/M_1d_2^2)(0.5 - \mu)c_2$; $[\eta] = \eta$ specific/c_2 at $c_2 = 0$; $\eta_{sp}/c_2 = [\eta] + K[\eta]^2c_2$, in which the 1 and 2 subscripts refer to solvent and solute, resp., c = concn., d = density, π = osmotic pressure. The following results are reported (fraction no., yield, consistency, M, $[\eta]$, μ, and K, resp., given): 1, 14.3%, elastic, 1,290,000, 2.00, 0.479, 0.88; 2, 12.5%, plastic, 408,000, 0.97, 0.475, 0.63; 3, 30.6%, very plastic, 144,000, 0.48, 0.467, 0.62; 4, 15.4%, viscous liquid, 57,000, 0.28, 0.466, 0.49; 5, 24.3%, viscous liquid, 21,000, 0.13, 0.468, 0.49. The unfractionated sample had a mol. wt. of 74,000 in toluene and in CCl_4. The relation between $[\eta]$ and M was $[\eta] = 2.15 \times 10^{-4}M^{0.68}$. Being sol. in toluene, the material is largely linear, but the variance in μ shows that the fractions differ some in structure, and the smaller values of K indicate that the fractions of lower mol. wt. are more branched. The values of M are smaller than those obtained by Scott (*C.A.* 41, 037*i*) and more in accord with those expected by K., *et al.*, for viscous liquids and plastic materials.

John Howe Scott

(3)



Retyped 12/7

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[illegible] Excess pressure evaluation method in the foaming process during the preparation of foamed [illegible]

[illegible] by the [illegible] reactive components under the [illegible] foamed during foaming [illegible] the cell walls of the [illegible]

the opposing gas pressure during the process. Excess pressure increases with an increase in the blowing agent and the bulk weight of the plastic.

38926X1.1

VINOGRADOVA, L.M., kandidat tekhnicheskikh nauk; KOROLEV, A.Ya., kandidat khimicheskikh nauk; STAROSTENKO, N.F., inzhener-mayor.

Improve visibility when flying in rain. Vest. Vozd. Fl. 39 no.4: 73-74 Ap '57. (MLRA 10:9)

(Airplanes--Windshields)

69-20-3-7/24

AUTHORS: Avgul', N.N.; Berezin, G.I., Kiselev, A.V.; Korolev, A.Ya.

TITLE: The Heat of Adsorption of Hydrocarbons on Carbon Blacks of Different Degrees of Graphitization (Teplota adsorbtsii uglevodorodov na sazhakh s razlichnoy stepen'yu grafitirovaniya)

PERIODICAL: Kolloidnyy zhurnal, 1958, vol XX, Nr 3, pp 298-304 (USSR)

ABSTRACT: In the article the adsorption isotherms and the differential heats of adsorption of 3-methylhexan and benzene on the black sferon-6, graphitized at 2,800°C, were studied. In Graph 1, the absolute adsorption isotherms of the two vapors on black sferon-6 heated to 1,700 and 2,800°C are represented. Both coincide, i.e. the temperature has no influence on the adsorption properties of blacks. The heats of adsorption of hydrocarbons on carbon black graphitized at 2,800°C are close to the theoretical values for the potential of adsorption forces calculated previously.

~~Card 1/2~~ There are 4 graphs, 3 tables, and 17 references, 13 of which are Soviet and 4 English.

Inst. Physical Chem, AS USSR, Lab Sorption Processes

Korolev, A.Ya.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824810014-3"

15(6)

AUTHOR: Rebinder, P. A., Academician SOV/30-59-1-5/57

TITLE: New Trends of Colloid Chemistry (Novyye puti razvitiya kolloidnoy khimii)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 44-51 (USSR)

ABSTRACT: [illegible]

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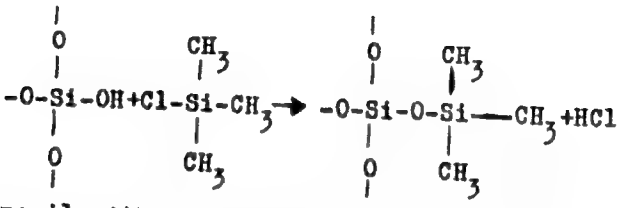
Card 4/6

The Chemical Modification of the Surface of Adsorbents and Its Influence on Adsorption Properties

SOV/20-124-3-35/67



Aerosil with a surface of about 150 m^2/g was treated for eight days at a temperature of 20° with saturated trimethyl chlorosilane vapor or with its solution in benzine. The greatest difference in the isothermal lines of adsorption is observed in steam. The adsorption of steam on a modified sample is several dozens of times lower than in the case of a normal sample. The isothermal line of the adsorption of steam on a modified sample is reversible, and it is not modified even after several months of contact with water, which is indicative of the strength of the surface compound formed. The second part of this paper deals with the formation of carbon black. The adsorption proper-

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The Chemical Modification of the Surface of Adsorbents and Its Influence on Adsorption Properties

ties of soot with respect to many adsorbed substances, especially with respect to polar ones, depend on the quantity of oxygen they contain. The authors modified gas black for the purpose of further graphitization. By annealing at more than 1500° the acid surface compounds are destroyed, the growth of graphite crystallites is promoted (chemical and crystallochemical modification) and the adsorption of the vapors of water, methanol, ammonia, methylamine, sulfur dioxide and other polar substances is considerably reduced. Thermal treatment, especially at temperatures of more than 2500°, makes the soot surface more homogeneous and prevents the adsorption of non-polar substances. Such a treatment of soot also increases its hydrophobic properties. An increase of the affinity of soot to polar substances, especially water, is of practical interest for polygraphical pigments and also for other polygraphically important cases. Also the nature of the surface and the colloid-chemical properties of soot are considerably modified by the oxide-treatment. The modi-

The Chemical Modification of the Surface of Adsorbents and Their Influence on Adsorption Properties

fication of soot also modifies the adsorption of steam considerably. The variations of the corresponding isothermal lines are discussed. The double hysteresis found on this occasion is typical of the superposition of two phenomena, viz chemosorption and capillary condensation. The thermal treatment of soot and its oxidation in the liquid phase is able to modify soot to such an extent that the adsorption of steams on it is modified by dozens and hundreds of times of its amount. There are 2 figures and 25 references, 12 of which are Soviet.

PRESENTED: September 6, 1958, by M. M. Dubinin, Academician

SUBMITTED: September 5, 1958

KOROLEV, A. YA.

5(4) 5.1115 66479

AUTHORS: Babkin, I. Yu., Vasil'yeva, V. S., Drogaleva, I. I., Kiselev, A. V., Korolev, A. Ya., Shcherbakova, K. D.

SOV/20-129-1-36/64

TITLE: The Effect of the Degree of Surface Modification of Silica by Trimethylchlorosilane on Its Absorptive Properties

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 131-134 (USSR)

ABSTRACT: In previous papers (Refs 1, 2) the authors showed that the physico-chemical surface properties of highly dispersed materials, such as carbon black or silica, can be influenced to a considerable degree by chemical reactions. The present paper reports on experiments carried out under the cooperation of L. I. Doroshina, M. G. Kus'mina, G. M. Lyulina, and L. F. Pavlova, with the aim of reducing the adsorbing capacity of highly dispersed non-porous silica (aerosil) for hydrocarbons. To attain this, the aerosil surface was occupied with $Si(CH_3)_3$-groups. Since complete occupation is only possible on previously hydratized silica, the following samples were investigated: (1) the original aerosil -

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sample A1, (2) original aerosil, modified by treatment with trimethylchlorosilane - sample A1M, (3) aerosil hydratized in an autoclave - sample A1H, and (4) aerosil, hydratized in an autoclave, and then modified by treatment with trimethylchlorosilane - sample A1HM. The amount of trimethylsilyl-groups adhering to the silica surface was determined by means of microelementary analysis. The degree $\theta_{Si(CH_3)_3}$ to which the surface area is occupied is calculated from the size of the trimethylsilyl-groups (42 Å^2). The specific surface, its carbon content, and the degree to which it is occupied by trimethylsilyl-groups are shown in table 1. The effect of these groups lies in the fact that the interspaces between the groups, even when the surface is not occupied completely, but only in the manner of a mosaic - become so small that the larger hydrocarbon molecules are not able to penetrate to the surface. The adsorption isotherms for vapors of n-hexane, benzene, and methanol are given in figure 1, those for water in figure 2. The adsorption of hydrocarbons is decreased less than that of water on a 58% modified

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surface. 93% Modification produces a sharp decrease in the adsorbing capacity of the surface. The isotherm for heavy hydrocarbons becomes practically linear. This phenomenon may be of value for the chromatographic separation of hydrocarbon mixtures by means of gas adsorption. There are 2 figures, 1 table, and 11 references, 9 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov). Vsesoyuznyy nauchno-issledovatel'skiy institut aviatsionnykh materialov (All-Union Scientific Research Institute for Aviation Materials)

PRESENTED: June 13, 1959, by M. M. Dubinin, Academician

SUBMITTED: June 11, 1959

Card 3/3

8514

S/191/60/000/007/008/015
B004/B056

15.8340

AUTHORS: Avrasin, Ya. D., Korolev, A. Ya., Mindlin, Ya. I., Drogaleva, I. V., Prigoreva, A. I.

TITLE: Effect of the Chemical Treatment of the Surface of Glass Fabric Upon the Properties of Glass Textolite

PERIODICAL: Plasticheskiye massy, 1960, No. 7, pp. 31 - 35

TEXT: It was the aim of the present work to improve the resistance to water of glass-reinforced plastics such as are used in aircraft construction and shipbuilding. A better binding between glass fiber and resin is attempted to be attained by treating the glass fiber with organo-silicon substances. Two sorts of glass textolite were examined: The type ФБ-25 (FB-25) from alkali-free aluminoborosilicate glass and СБС-1 (SBS-1) phenolformaldehyde-resol resin, and type 911-1 made of the same glass and polyacryl ester resin. The glass fabric was oiled with a paraffin lubricant of the type АСТТ(а)-Т(А STT(b)-T), which was removed by means of CCl_4. Glass fabric for the production of FB-25 was

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85145
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B004/B056

Effect of the Chemical Treatment of the Surface of Glass Fabric Upon the Properties of Glass Textolite

dipped for two minutes into 3% solutions of silane derivatives of the type МР(MR), МГ(MG), ФР(FR), ФА(FA), after which they were heated to 50 - 150°C. These silane derivatives contained hydroxyl- or amino groups. For 911-1 glass textolite, the glass fabric was treated with silane derivatives, which contained vinyl- and methacryl groups: Type 7М(7M), product 10 and ВР(VR). 7M and VR contain functional groups with double bonds. The strength of the samples was tested in dry state and after two hours' boiling in water. The results are given in four tables: Minimum and maximum and average values of the serial tests, remaining strength in % of the initial one, water absorption and weight by volume. [Abstracter's note: The content of the tables is abridged. The following has been omitted: average value [%] of the remaining strength, water adsorption and weight by volume.]

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85145

Effect of the Chemical Treatment of the Surface of Glass Fabric Upon the Properties of Glass Textolite

S/191/60/000/007/008/015
B004/B056

Table 1. Strength of FB-25 with treated glass fabric in static bending

Lubricant	Treatment	Bending strength limit [kg/cm²] dry	boiled	Percentage of resin
not eliminated	no one	2400-2685	1190-1440	29.2
eliminated	no one	2830-2990	1285-1555	31.3
eliminated	with MR	2120-2490	1845-1895	29.7
eliminated	with MG	1815-2130	1550-1675	30.4
eliminated	with FR	1980-2066	1640-2080	31.2
eliminated	with FA	2055-2340	1495-2120	31.2

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Effect of the Chemical Treatment of the Surface of Glass Fabric Upon the Properties of Glass Textolite

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B004/B056

Table 2. Physico-Mechanical Properties of F-25 After Treatment of the Glass Fabric

Lubricant	Treatment	Limit [kg/cm^2] of stress dry	strength boiled	compression dry	strength boiled	shear dry	strength boiled
not eliminated	no one	2340-2905	1805-1820	1185-1400	615-790	97	73
eliminated	with MR	2920-3315	2885-2940	1040-1180	1105-1275	95-95	80-90
eliminated	with FR	2940-3015	2300-2535	855-1040	760-795	85-90	65-95

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85115

Effect of the Chemical Treatment of the Surface of Glass Fabric Upon the Properties of Glass Textolite

S/191/60/000/007/008/015
B004/B056

Table 3. Strength of 911-1 With Treated Glass Fabric in Static Bending

Lubricant	Treatment	Bending strength limit [kg/cm^2] dry	boiled	Percentage of resin
not eliminated	no one	1665-1955	710-855	37.0
eliminated	no one	1650-1760	625-735	-
not eliminated	with 7M	1495-1665	820-1235	37.1
eliminated	with 7M	1940-2020	945-1055	38.1
eliminated	with VR	1210-1380	905-1270	41.3

Card 5/6

S/069/60/022/006/002/008
B013/B066

AUTHORS: Kiselev, A. V., Korolev, A. Ya., Petrova, R. S., and Shcherbakova, K. D.

TITLE: Effect of the Degree of Chemical Modification of the Silica Surface With Tetramethyl Chloro Silane on the Adsorption of Nitrogen- and Krypton Vapors

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol. 22, No. 6, pp. 671-679

TEXT: The authors of the present paper studied the effect of the silica surface modification on the adsorption of nitrogen- and krypton vapors. They achieved a considerable reduction of the interaction energy adsorbate - adsorbent by substituting trimethyl silyl groups for the hydrogen of the hydroxyl groups on the silicon dioxide surface. The adsorption of nitrogen- and krypton vapors was studied on five Aerosil samples. Aerosil is a non-porous, highly disperse silica which was treated with trimethyl chloro silane vapor or solution in benzine. To obtain samples modified as completely as possible, Aerosil is hydrated for 19.5 hours in the autoclave at 350°C and 169 atm with water, and then treated

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Effect of the Degree of Chemical Modification of the Silica Surface With Tetramethyl Chloro Silane on the Adsorption of Nitrogen- and Krypton Vapors

S/069/60/022/006/002/008
B013/B066

A

with $ClSi(CH_3)_3$. This led to an up to 90% occupation of the Aerosil surface with $Si(CH_3)_3$ groups. The adsorption isotherms of nitrogen and krypton vapors were plotted at temperatures of liquid nitrogen. The adsorption of the two substances was found to be reduced by modifying the silica surface with trimethyl silyl groups. The krypton adsorption considerably decreases at a high degree of modification. Also the shape of the adsorption isotherms varies i.e., they are less bent. The isotherms for the above vapors are plotted in coordinates of the BET equation. It may be seen from it that owing to the reduction of the absolute adsorption quantity the BET equation is less satisfied, because with the less intense interaction of adsorbate - adsorbent, the interaction of adsorbate - adsorbate must not be neglected any longer. The specific surface for non-modified silica samples may be determined by the BET method, e.g. on the basis of the nitrogen vapor adsorption. For modified samples, however, the values obtained by the BET method are too low. It was found that the adsorption of nitrogen- and krypton vapors depends on the degree

Card 2/4

of modification to such an extent that the BET method is not applicable for determining the specific surface of considerably modified samples. The adsorption isotherms obtained for the nitrogen and krypton vapors were compared with the isotherms previously obtained (Refs. 6,7,10) for vapors of n-hexane, benzene, methanol, and water (Fig. 3). Modification was shown to effect a considerable reduction of adsorption in all adsorbents. Fig. 4 illustrates the approximate course of the adsorption decrease at $p/p_s = 0.1$ with increasing occupation θ of the surface by $Si(CH_3)_3$ groups.

V. P. Dreving is thanked for developing a volumetric apparatus, and B. G. Aristov for plotting the adsorption isotherms of nitrogen. There are 4 figures, 3 tables, and 35 references: 22 Soviet, 5 British, 4 US, and 3 German.

ASSOCIATION: Moskovskiy universitet im. M. V. Lomonosova Khimicheskiy fakul'tet, Laboratoriya adsorbtsii (Moscow University imeni M. V. Lomonosov, Chemical Division, Adsorption Laboratory)

Effect of the Degree of Chemical Modification of the Silica Surface With Tetramethyl Chloro Silane on the Adsorption of Nitrogen- and Krypton Vapors

S/069/60/022/006/002/008
B013/B066

SUBMITTED: September 24, 1959

Legend to Fig. 4: 1 - water vapor, 2 - methanol, 3 - benzene, 4 - krypton, 5 - nitrogen

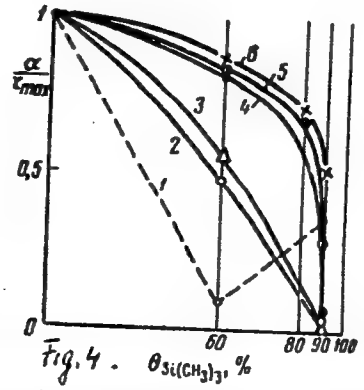

Fig. 4. $\theta_{Si(CH_3)_3}$, %

S/661/61/000/006/078/081
D287/D302

AUTHORS: Korolev, A. Ya. and Vinogradova, L. V., Moscow

TITLE: Investigations into imparting hydrophobic properties to silicate glasses

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad, Izd-vo AN SSSR, 1961, 338-341

TEXT: These investigations were carried out within the framework of developing special chemical compounds for improving the transparency of airplane windscreens when flying in rainy weather. Three types of hydrophobing agents were tested: Methyl trichlorosilane, dimethyl dichlorosilane and trimethyl chlorosilane; the last-named compound was most effective, methyl trichlorosilane was least satisfactory. Two types of interaction were observed on treating glass with dimethyl dichlorosilane: Formation of a chemically bound coat-

Card 1/3

ing and formation of polymers which can be washed off from the surface. It was found that the type of organosilicon compound influenced only to a slight degree the wetting angle of the glass, but that the hydrophobic properties changed considerably during prolonged impact of H_2O. During uninterrupted, prolonged rain the hydrophobic properties of the glass disappeared. It was discovered that hydrophilic laminae are formed on the surface of the organosilicon coatings. The hydrophobic characteristics were restored by wiping the glass with a wetted cotton wool swab. The different characteristics of the individual organosilicon compounds are discussed. However, noneof the compounds was entirely satisfactory as they did not retain their hydrophobic characteristics after 12 hours rain. Further experiments led to the use of 2-layer coatings consisting of an organosilicon base layer and an organic top coating of ceresine, polyethylene, polyisobutylene and petroleum wax. This type of coating increased the protective properties by 100%. The author stated, in reply to a question during the discussion, by N. N. Suykovskaya (GOI, Leningrad), that the laboratory experiments had been

Investigations into imparting ...

carried out at 20°C and experiments under actual conditions at a temperature of 60°C. He also gave details of determination of the hydrophobic properties and stated, in reply to a further question, that distilled water, tap-water and sea-water had been used during the experiments.

Card 3/3

5.1115
17.1154

28280
S/069/61/023/005/005/008
B124/B101

AUTHORS: Kiselev, A. V., Kovaleva, N. V., Korolev, A. Ya.

TITLE: Adsorptive properties of oxidized carbon blacks. 1. Oxidation of channel black in an aqueous medium

PERIODICAL: Kolloidnyy zhurnal, v. 23, no. 5, 1961, 582 - 591

TEXT: In this paper, the adsorptive power of channel gas carbon black samples from Ukhta with a specific surface of about 150 m^2/g and an oxygen content of 4.4% which had been oxidized in aqueous solution without heating with sodium hypochlorite, hydrogen peroxide, and a mixture of HNO_3 and H_2SO_4, was investigated. The chemisorbed-oxygen content, hydrophilic properties, and wettability of the carbon black are increased by polar organic liquids. The carbon black forms highly disperse colloidal hydrosols without addition of organic wetting agents. After drying and removing substances adsorbed on carbon black by exhaustion at 150°C. the C and H contents were determined by a microanalytical technique, and the total oxygen content was established

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28280
S/069/61/023/005/005/008
B124/B101

Adsorptive properties of...

from the difference. The presence of active oxygen was detected by adsorption of NaOH from the aqueous solution and by determining the content of hydroxyl or phenol groups according to Grignard. The volatile substances content was determined by heating the carbon black to 820°C. The nitrogen content in the carbon black samples treated with the HNO_3 - H_2SO_4 mixture was determined by the Kjeldahl technique, and was found to be 0.27%. The specific surface was calculated from the adsorption isotherms of nitrogen vapor at the boiling point of nitrogen according to BET. Data on the specific surface and the chemical composition of carbon blacks oxidized by various techniques are given in a table. The oxidation of the carbon black surface leads to a reduced adsorption of n-hexane vapor. This is due to the fact that the oxidized surface is covered with oxygen-containing groups so tightly that there is no more room available for the large n-hexane molecules. The increase in the adsorptive power for benzene vapor with the oxidation degree of the carbon black surface is due to the fact that the interaction of the π-bonds in the benzene molecules with the OH groups on the surface of oxidized carbon black samples is intensified. The difference between oxidized and non-oxidized carbon black surfaces

Card 2/6

S/020/61/136/002/025/034
B004/B056

AUTHORS: Babkin, I.Yu., Kiselev, A.V., and Korolev, A.Ya.

TITLE: Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol.136, No.2, pp.373 - 376

TEXT: The authors studied the adsorption of hydrocarbon vapors on the surface of aerosils, which had been treated with trimethylchlorosilane. A theoretical calculation of the adsorption energy of n-hexane and benzene molecules (Ref. 3) resulted, with increasing modification of the silicon dioxide, in a drop of the adsoption energy below the value of condensation heat. It was assumed that in the case of sufficiently modified aerosil, the adsorption heat of these hydrocarbons must become negative. It was the purpose of the present work to check this assumption. In order to give the aerosil surface greater homogeneity and reactivity with respect to trimethylchlorosilane, a hydrothermal treatment in an autoclave was carried

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Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

S/020/61/136/002/025/034
B004/B056

out at 120 - 265°C for 8 - 19.5 hours. Specimens of aerosils were obtained, whose surface was occupied by Si $(CH_3)_3$ groups degree of occupation: 0, 60, 85, 90, or 100%. For these specimens, Fig. 1 shows the calorimetric differential adsorption heat Q_a (kcal/mole) as a function of adsorption α (μ-mole/m^2), and Fig. 2 shows the isothermal lines for α as a function of the relative vapor pressure p/p_s. The dropping of Q_a below the condensation heat L was observed, and for the completely (100%) modified specimen, the true adsorption heat was found to be: $Q_a - L = -0.5$ with n-hexane; $Q_a - L = 1.0$ with benzene.

Accordingly, adsorption α decreases considerably with a constantly rising modification (Fig. 2). In the case of large p/p_s, the surface is occupied with hydrocarbon molecules to such a small content that capillary condensation may occur in between. The adsorption heats measured thus include the heat of capillary condensation, and the true adsorption heats must be still lower. From the adsorption isothermal lines and the adsorption heats, the differential adsorption entropies for n-hexane and benzene

Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

S/020/61/136/002/025/034
B004/B056

were calculated. With growing modification, a transition from negative to positive values took place. With $\alpha = 1\mu$-mole/m^2, $\partial\Delta S/\partial\alpha$ on aerosil with 0% modification amounted to about -2.5 cal/deg.mole for benzene, and about -0.5 for n-hexane, while the following values were obtained for 100% modified aerosol: benzene, about +2 cal/deg.mole; n-hexane, about +1 cal/deg. mole. This indicated a higher mobility of the adsorbed hydrocarbon molecules on the modified surface. With 100% modification, a non-localized adsorption is assumed. For the initial part of the adsorption isothermal line, which is not yet distorted by capillary condensation, T.H.Hill's equation (Ref. 7) therefore holds. A combination of the geometric modification (hydrothermal treatment in an autoclave) with chemical modification (reaction with trimethylchlorosilane) thus smoothened the surface of silicon dioxide and led to the formation of a homogeneous layer of trimethylsilyl groups, on which the adsorption of n-C_6H_{12} and C_6H_6 is not localized and the adsorption heat becomes negative. The authors thank I.V.Drogaleva and V.P.Marinkova for their assistance. There are 4 figures, 1 table, and 10 references, 7 of which are Soviet, 2 US, and 1 German.

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Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

S020/61/136/002/025/034
B004/B056

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

PRESENTED: July 2, 1960 by M.M.Dubinin, Academician

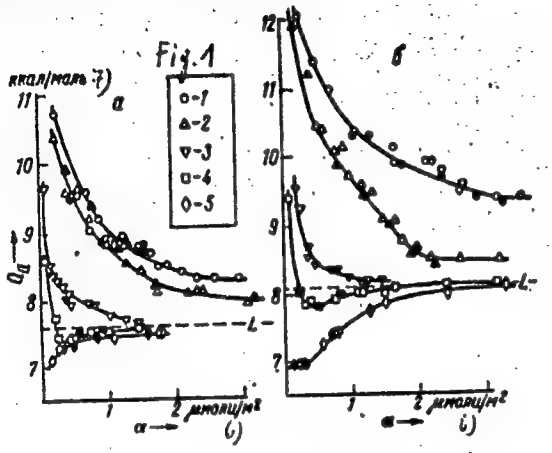
SUBMITTED: June 30, 1960

Card 4/7

Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

S/020/61/136/002/025/034
B004/B056

Fig. 1



Card 5/7

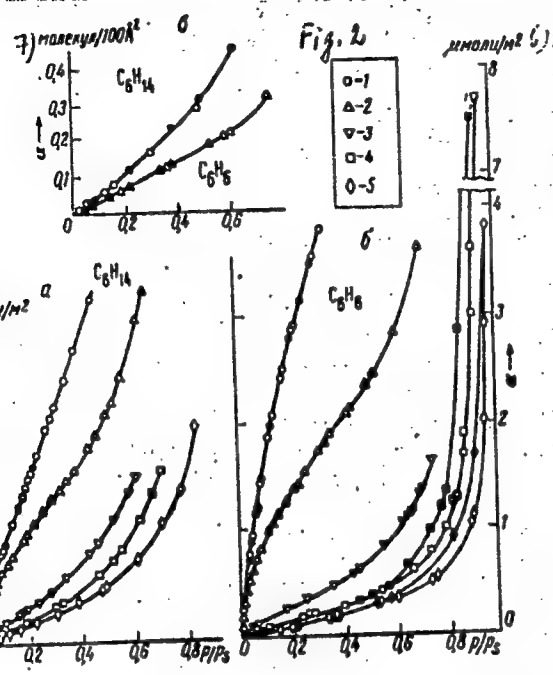


Fig. 2

o-1	
Δ-2	
▽-3	
□-4	
◇-5	

S/020/61/136/002/025/034
B004/B056

Adsorption Heats and Entropies of Hexane and Benzene Vapors...

Card 6/7

Adsorption Heats and Entropies of Hexane and Benzene Vapors on an Aerosils With a Surface Modified by Trimethylsilyl Groups

S/020/61/136/002/025/034
B004/B056

Legend to Fig. 1: a) n-hexane; б) benzene; 1) initial aerosol; 2) 60%; 3) 85%; 4) 90%; 5) 100% modified aerosol; 6) μ-mole/m^2; 7) kcal/mole.

Legend to Fig. 2: a) n-hexane; б) benzene; 1) initial aerosol; 2) 60%; 3) 85%; 4) 90%; 5) 100% modified aerosol; в) initial section for sample 5) on enlarged scale; 6) μ-mole/m^2; 7) molecules/100 A.

Card 7/7

S/020/61/136/004/018/026
B028/B060

AUTHORS: Vasil'yeva, V. S., Drogaleva, I. V., Kiselev, A. V., Korolev, A. Ya., and Shcherbakova, K. D.

TITLE: Geometrical and Chemical Modifications of Silica Gel for Purposes of Gas Chromatography

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 4, pp. 852-855

TEXT: The present paper deals with the crystalline and the chemical modifications of SiO_2. Silica gel of the type ШСК(ShSK) served as the initial material. Industrial silica gel was washed with diluted hydrochloric acid (1:1) for the purification of iron and other metal ions (up to the negative reaction with ammonium thiocyanate, and with distilled water for the purification of Cl ions (up to the negative reaction with silver nitrate). This purified СИ (SI) silica gel had an inhomogeneous surface and constituted the initial material for the further modification experiments. For the crystalline modification, SI

~~Card 1/5~~
Card 1/3

was heated with water in the autoclave at 275°C for 19.5 hours. The resulting product was СГ (SG) silica gel. Type СГМ(SGM) was obtained by treating SG with liquid trimethyl chloro silane. The analysis of SGM for C content showed that 100 A of the SGM surface contained 1.22% C, i.e., on an average, 2.7 trimethyl chloro silyl groups. This corresponds to a coating by organosilicon film of an almost maximum density. Prior to the adsorption experiments, the samples were heated for a fairly long time in vacuum adsorbers in small suspended quartz crucibles at 150°C and a pressure of $1 \cdot 10^{-5}$ mm Hg. In the range of pressure ratios of p/p_s from 0 to 1, isothermal lines were obtained for the adsorption and the desorption of benzene vapor. In the case of SG the isothermal line deviates sharply toward the lower right side. With the beginning of the capillary condensation the hysteresis curve shifts from $p/p_s = 0.2$ for SI to $p/p_s = 0.75$ for SG. At $p/p_s = 0.1$, the benzene adsorption a on SI and SG equals $2\mu mole/m^2$, whereas $a = 0.1\mu mole/m^2$ for SGM. In other words, the benzene adsorption drops to the 20th part with the chemical modification (SGM). Experiments with SGM were conducted jointly with R. S. Petrova, N. Ya. Smirnov, V. I. Kalmanovskiy, N. Balakhnina, and Ya. I. Yashin.

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9

Geometrical and Chemical Modifications of Silica Gel for Purposes of Gas Chromatography

S/020/61/136/004/018/026
B028/B060

Experiments concerning the possibilities of application of SGM for chromatography were made with a chromatograph of the firm Griffin and George, featuring a column 4mm in diameter and 1m in length. Benzene was kept in the column at normal temperature for 30 min. At 82°C, the time for benzene was 12'40", and 1'50" for hexane. For benzene-hexane separations by gas-adsorption chromatography, the silica gels used were impregnated with silicon E-301 (Ye-301). As may be seen from Fig. 2 (2б and 2в) benzene-hexane mixtures are more quickly distributed by the method of gas adsorption than by the gas-liquid method. There are 2 figures, 1 table, and 9 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences USSR). Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: December 28, 1960, by D. I. Shcherbakov, Academician

SUBMITTED: July 25, 1960

Card 3/3

35900

S/191/62/000/005/008/012
B110/B101

15.9160

AUTHORS: Korolev, A. Ya., Zherebkov, S. K., Borisova, F. K., Medvedeva, A. M., Grozhan, Ye. M.

TITLE: Gluing of ftoroplast-4 to rubbers

PERIODICAL: Plasticheskiye massy, no. 5, 1962, 37-39

TEXT: Ftoroplast-4 (polytetrafluoro ethylene) was glued to organofluorine and acrylonitrile rubbers. For this purpose the surface, degreased by means of gasoline, was modified with a sodium-naphthalene complex activated by addition of 2 g-atom Na metal per mole naphthalene in 1 liter tetrahydrofuran. After 40 sec treatment of the film, rinsing in acetone and water, and 30 min drying at 100°C, the surface color turned from milky white to gray-brown. The contact angle of wetting with water dropped here from 106 to 45-55°. Crude rubbers were pasted on using glue on the basis of nitrile rubber and thermoreactive resin (ФЭН-1 (FEN-1)). The strength of gluing of organofluorine and acrylonitrile rubbers to ftoroplast-4 with smooth surface was 0.56-0.92 kgf/cm, with rough surface 2.55-5.60 kgf/cm. The gluing of СКН-26 (SKN-26) rubber to

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S/191/62/000/005/008/012
B110/B101

Gluing of ftoroplast-4 to rubbers

ftoroplast-4 with rough surface was stable against heat aging at 100 and 170°C and 50 hr effect of АМГ-10ф (AMG-10f) medium at 170°C. By means of FEN-1, ftoroplast-4 films can also be glued to one another, to vulcanized organofluorine and acrylonitrile rubbers, and to metals, the heat treatment lasting for 60 min at 100°C. Glued joints with ftoroplast-4 with rough surface were destroyed within the rubber. There are 5 tables.

Card 2/2

S/069/62/024/002/003/008
B110/B144

5.1115

AUTHORS: Drogalev, ... V., Kiselev, A. V., Korolev, A. Ya., El'tekov, Yu. A.

TITLE: Production and properties of ethylene glycol aerosil

PERIODICAL: Kolloidnyy zhurnal, v. 24, no. 2, 1962, 152 - 158

TEXT: The surface of aerosil was modified with ethylene glycol to reduce the adsorption energy and preserve the hydrophilic character and selective action of functional groups. Etherification of silanol groups with ethylene glycol $-\overset{|}{\underset{|}{Si}}-OH + HOC_2H_4OH \longrightarrow -Si-O-C_2H_4OH + H_2O$ causes coating of the aerosil surface with ethylene glycoxy groups, one hydroxyl group of which is located at the end. First the increase in the degree of modification is comparatively fast as the time of ethylene glycol action increases, then it slows down. The number of $\sim CH_2-CH_2-$ groups grafted onto the unit surface varies between 2 and 6 per 100 A^{02}. When one hydroxyl group reacts with one diol molecule, the substitution degree of OH groups is:

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Θ-OH $\longrightarrow$ -OC_2H_4OH = $^{\alpha}$-CH_2-CH_2-/$^{\alpha}$-OH$\rangle\!/^{\alpha}$-CH_2-CH_2-/9. Only 2/3 of the OH groups located on the surface of hydrated silica were substituted. The adsorption isotherms of substituted aerosils showed that the adsorption of nitrogen, n-hexane, and argon vapors was not affected but that of benzene and methanol vapors rapidly reduced. This reduction is due to chemical changes of the surface and their effect on adsorption since the specific surface of aerosil is hardly changed by etherification. In a dense monolayer, the area per molecule is $\omega_m = s_{N_2}/a_m N$, where a_m is the capacity of the monolayer, s_{N_2} is the specific surface. Substitution of ethoxy for silanol groups causes decrease in a_m for methanol and benzene. With nitrogen and methanol the equilibrium constant decreases with increasing substitution degree. Grafting may be applied to diol substitution: (1) to one or two OH groups, (2) to -Si-O-Si- bridges, and (3) to bridges and OH groups. More complex compounds may form on the surface since ethylene glycol forms polymer chains in the presence of oxide catalysts. This causes a composite mosaic structure of the modified layer. Screening of silica with ethylene

glycol groups improves dispersion and disaggregation of aerosil particles owing to a decrease in their interaction. Disaggregation is important for the introduction of modified aerosil as filler into polyurethanes. The gluing strengths of modified and initial quartz hardly differ. The hydroxyl groups of the quartz surface react vigorously with the isocyanate groups of the glue. The adhesive power is to be preserved, and wetting and complete disaggregation of filler particles in the polymer are to be reached by chemical modification - aimed regulation of surface properties of highly disperse fillers. Screening of the silica surface by a dense layer of unpolar, chemically inert groups reduces adsorption and adhesion. Modification with dimethyl dichloro silane thus forms a thick, continuous polymethyl siloxane layer eliminating the polar glue-quartz adhesion. There are 2 figures, 4 tables, and 16 references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR Gruppa khimii poverkhnosti (Institute of Physical Chemistry AS USSR, Group of Surface Chemistry). Moskovskiy universitet im. M. V. Lomonosova Laboratoriya adsorbtsii Khimicheskiy fakul'tet (Moscow University imeni M. V. Lomonosov, Adsorption Laboratory, Chemical Division)

Production and properties of ethylene... S/069/62/024/002/003/008
B110/B144

SUBMITTED: April 26, 1961

KOROLEV, A. YA.

AUTHORS: Aristov, B. G., [illegible]
Kamenskhov, [illegible]
A. L.

TITLE: The modification [illegible]
hydrothermal treatment

PERIODICAL: Kolloidnyy zhurnal, v. [illegible]

TEXT: The influence of [illegible] on the aerosil's specific surface [illegible] systematically studied, and [illegible] microscope. The original [illegible] high-temperature hydrolysis of [illegible] prepared by burning off silicon-[illegible] treatment was accomplished at [illegible] and 192 hr, after which [illegible] adsorption of nitrogen at [illegible] specific surface [illegible]

Card 1/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824810014-3"

The modification of highly dispe...

Table 1 show that the specific ... temperature and duration of ... exposures showed that this is due ... the absolute amount of adsorption ...

saturation vapor pressure of the nitrogen) a ... obtained (Table 2). Within the range ... represented by the BET equation: ...

α_m = 10.25 μmol/m^2, C = 164. In the range ... conforms to Halsey and Hill (references see below). ... Pierce (reference see below) this means ... = 1.30/log(p/p$_s$). It is pointed out ... to determine the specific ... silica with hydroxyl ... point, according to the ... in μmol/g and α the ...

Cont 2/4

The modification of highly dispersed... [illegible] S107/[illegible]

6 figures and 2 tables. [illegible] ...are: G. D. Halsey, J. Chem. Phys. [illegible] Phys., 17, 590, 1960; G. [illegible] 1101, 1960.

ASSOCIATION: Moskovskiy universitet [illegible] (Moscow University, Division [illegible])

SUBMITTED: September 9, 1961

Table 1. Specific surface area (m^2/g) of [illegible] in dependence on temperature and duration of [illegible] The specific surface area of the initial [illegible] 1.7 m^2/g. Legend: 1. Temperature in °C; 2. Duration of treatment in hr; 3. Specific surface area in m^2/g.

Table 2. Absolute amount of nitrogen [illegible] adsorbed, at its boiling point, on hydrated samples of [illegible] covered by a molecule of nitrogen [illegible] thickness is put at 16.2 [illegible]

Card 3/-, 3

KOROLEV, A.Ya.; BEK, V.I.; GRISHIN, N.A.

Adhesion of polytetrafluoroethyle to metals.
Vysokom.soed. 4 no.9:1411-1418 S '62. (MIRA 15:11)
(Ethylene) (Plastics) (Adhesion)

BODROVA, V.V.; DROGALEVA, I.V.; KISELEV, B.A.; KOROLEV, A.Ya.; LEZNOV, N.S.; MINDLIN, Ya.I.

Method for improving the properties of glass plastics. Plast. massy no.3:30-32 '63. (MIRA 16:4)

(Glass reinforced plastics)

S/069/63/025/002/003/010
A057/A126

AUTHORS: Kiselev, A.V., Korolev, A.Ya., El'tekov, Yu.A.

TITLE: On the adsorption on estersils

PERIODICAL: Kolloidnyy zhurnal, v. 25, no. 2, 1963, 165 - 168

TEXT: In continuation of earlier investigations the authors compare adsorption isotherms of nitrogen and argon vapors at -195°C and methanol, benzene, and n-hexane vapors at 20°C on aerosil with those obtained on estersils prepared by a treatment of the aerosil surface with ethylene glycol or resorcinol. More than half of the surface of the estersils was covered by ester groups. With respect to adsorption capacity for argon, nitrogen and n-hexane, the adsorbents arranged themselves in the order resorcinolestersil > glycolestersil, whereas with respect to benzene and methanol the order was aerosil > resorcinolestersil > > glycolestersil. There are 2 figures and 1 table.

ASSOCIATION: Moskovskiy universitet, Khimicheskiy fakul'tet (Moscow University, Chemical Department); Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry of the AS USSR)

SUBMITTED: May 31, 1962

Card 1/1

L 12730-63 EPR/EPF(c)/EWP(j)/EWT(m)/BDS AFFTC/ASD Ps-4/Pr-4/Pc-4 RM/WW
ACCESSION NR: AP3002285 S/0062/63/000/006/1017/1022

AUTHOR: Aristov, B. G.; Babkin, I. Yu.; Borisova, F. K.; Kiselev, A. V.; Korolev, A. Ya.

TITLE: Changing the surface properties of polyethylene by oxidative treatment

SOURCE: AN SSSR. Izv. Otdeleniye khimicheskikh nauk, no. 6, 1963, 1017-1022

TOPIC TAGS: surface properties, polyethylene, oxidizing, surface polarity, adhesive properties, adsorption

ABSTRACT: Treating polyethylene with an oxidizing chrome composition (potassium dichromate and sulfuric acid) for 5 minutes at temperatures below 120 degrees) sharply increased its surface polarity, thus improving its adhesive properties, permitting gluing with polar adhesives and printing with inks. Oxidative treatment of low-pressure powdered polyethylene hardly changes its specific surface, as determined by very little difference in low-temperature adsorption of nitrogen between untreated and strongly oxidized material. However, the irreversible adsorption of water and the heat of adsorption were greatly increased, this adsorption being proportional to the degree of oxidation of the sample. Orig. art. has: 3 figures and 1 table.

Association: Moscow St. Un., Inst. of Physical Chemistry

Card 1/2

L 16879-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS/ES(w)-2 AFFTC/ASD/SSD Pz-4/
Pc-4/Pr-4/Pab-4 RM/WW/MAY

ACCESSION NR: AP3006539 S/0191/63/000/009/0036/0040

AUTHORS: Zherdev, Yu. V.; Korolev, A. Ya.; Zakharov, V. A.

TITLE: Microscopic investigation of the cracking of VPM-1 fiberglass by thermal aging

SOURCE: Plasticheskiye massy*, no. 9, 1963, 36-40

TOPIC TAGS: glass fiber cracking, fiberglass, plastics, VPM-1 microstructure, fiberglass insulating property, fiberglass mechanical property, fiberglass thermal aging, KOH

ABSTRACT: In the microscopic study of VPM-1, based on organosilicon resin and low alkali glass, etching with solvents and hot KOH facilitated the observation of the fine structure of the resin. At 200C the linkage between binder & filler starts to break. The kinetics of pore and crack formation in thermal aging at 300-400C were studied. Thermal aging causes internal stresses producing brittle breakdown of the binder and almost complete stripping from the fiber. It was discovered the fiber has a catalytic effect on strengthening the adjacent thin layer of binder. To improve insulating and mechanical properties of the fiberglass, the resin needs to be modified to increase its adhesiveness to the glass

Card 1/2

L 18879-63

ACCESSION NR: AP3006539

and to form a more elastic intermediate layer on the fiber. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 30Sep63 ENCL: 00

SUB CODE: MA NO REF SOV: 006 OTHER: 009

Card 2/2

ZHERDEV, Yu.V.; KOROLEV, A.Ya.

Microscopic analysis of the chemically modified surface of polytetrafluoroethylene. Plast.massy no.12:35-39 '63. (MIRA 17:2)

L 19744-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/T/EWP(b) Pc-4/Pq-4/Pr-4/
Ps-4/Pt-10 ESD(gs)/ESD(t) WW/RM/WH/MLK
ACCESSION NR: AT4049865 S/0000/64/000/000/0260/0264

AUTHOR: Zherdev, Yu. V., Korolev, A. Ya., Leznov, N. S.

TITLE: The effect of fillers on the curing of silicone resins

SOURCE: Khimicheskiye svoystva i modifikatsiya polimerov (Chemical properties and the modification of polymers); sbornik statey. Moscow, Izd-vo Nauka, 1964, 260-264

TOPIC TAGS: silicone, silicoorganic resin, silicone hardening, filler, silicone thermomechanical property, thermal degradation, polyphenylmethylsiloxane, carbon black, zinc oxide, lead oxide, glass fiber.

ABSTRACT: Determination of the thermomechanical properties of thermally treated polyphenylmethylsiloxanes proved that zinc or lead oxide and particularly ferric oxide markedly inhibit curing at 220-200C, whereas white carbon black and to a lesser degree "alkaline-free" glass fiber accelerate the process of curing. In tests of thermal stability at 400C white carbon black was also shown to act as a stabilizer. The accelerating effect of glass fiber on curing improved after thermal pretreatment at 400C, and its activity was shown to be related to surface effects and the presence of traces of alkali. The widely different effects of the fillers studied do not generally depend on the pH of aqueous extracts, since all extracts had a pH of 6.6-6.8 except that of glass fiber with pH 8.6. The resins were

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L 19744-65
ACCESSION NR: AT4049865

tested with 50% filler after curing for 2 hrs. or longer at 120 and 150C, pressing for 10 min. under 300 kg/cm^2, and also after additional curing at 150-200C. Testing loads were 4.3 kg/cm^2, at temperatures up to 400C. Addition of 1-5% epoxide resin to the fillers and formation of a thin film, less than 0.1μ thick, on the filler surface eliminated the inhibitory effects of zinc, lead, or ferric oxides. Tests on the thermal decomposition of filled and non-filled resins showed that glass fiber, zinc oxide, and particularly lead oxide promote thermal breakdown, whereas ferric oxide and white carbon black act as stabilizers. The observed effects with various compounds are discussed and related to published theories and/or experimental results. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 20Jun63 ENCL: 00 SUB CODE: MT

NO REF SOV: 009 OTHER: 009

Card 2/2

ACCESSION NR: AP4045018 S/0191/64/000/009/0018/0020

AUTHOR: Vinogradova, L. M., Korolev, A. Ya., Davy*dov, P. V., Kuchenkova, R. V.

TITLE: Selection and application of organosilicon liquids for decreasing the adhesion of plastics to solid surfaces

SOURCE: Plasticheskiye massy*, no. 9, 1964, 18-20

TOPIC TAGS: organosilicon, molding, antiadhesion film, polyethylhydrosiloxane, polymethylhydrosiloxane, plastic adhesion, polydimethylsiloxane

ABSTRACT: The effect of the nature and composition of organosilicon solutions and of the molding conditions of thin films on their effectiveness in decreasing adhesion of polymers to hard surfaces was studied. Liquid polymethyl- and polyethyl-hydrosiloxane and polydimethylsiloxane with a varying content of hydroxyl groups were investigated. The effect on the adhesive properties of treatment of a silicate glass surface with polymethylhydrosiloxane solutions and the effect of the treatment of a steel surface with a 5% polymethylhydrosiloxane solution in benzine were investigated and discussed on the basis of tabulated data. The experimental data for both tests agreed substantially. It was found that adhesion to polar compounds can be completely eliminated by surface treatment with polyethylhydrosiloxane solutions in benzine or with aqueous emulsions of this liquid.

Card 1/3

ACCESSION NR: AP 4045018

During hardening of films from polydimethylsiloxane solutions, which contain 2.7% hydroxyl groups in the macromolecule, on the surface of steel, either at 200C for two hours or even in the presence of a catalyst (tin diethyldicaprylate) at room temperature for 48 hours, the resistance to peeling decreased from 412 kgs/cm^2 (control sample) to 16-20 kgs/cm^2 (modified sample). Polydimethylsiloxane without hydroxyl groups affects adhesion to the steel only slightly, even at a hardening temperature of 200C. Thin layers of the investigated organosilicon solutions with active functional groups are retained strongly on steel or glass surfaces. They are not removed even by prolonged extraction of the sample with boiling (80C) benzine, and retain their anti-adhesion properties at the level found before extraction. These anti-adhesive agents increase the molding performance and can also be used advantageously for molding heat-stable rubbers. The organosilicon compounds, by forming very thin films on the walls of the molds, facilitate the removal of the plastic moldings from the mold, ensure a smooth surface and protect the metal molds against corrosion. In addition to thermal stability, their chemical inertness toward the material of the molds is another advantage. "The tests on PMS-31 (polymethylhydrosiloxane) were carried out with the cooperation of A. A. Moiseyev, V.V. Pavlov, V.P., Terebenin and V.P. Frolov". Orig. art. has: 3 tables.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4045018

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

NO REF SOV: 009 OTHER: 000

Card 3/3

L 35470-65 EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4/Pt-10 WW/DJ/RM

ACCESSION NR: AP4046896 S/0191/64/000/010/0016/0019

AUTHOR: Zherdev, Yu. V.; Korolev, A. Ya.; Leznov, N. S.

TITLE: Effect of different hardening catalysts on the thermo-oxidative degradation of polyorganosiloxanes

SOURCE: Plasticheskiye massy, no. 10, 1964, 16-19

TOPIC TAGS: polyorganosiloxane, siloxane, thermal degradation, oxidative degradation, depolymerization catalyst, tin diethyldicaprylate, polyethyl aluminosiloxane, potassium hydroxide, potassium acetate, sulfuric acid, ammonium acetate

ABSTRACT: The thermal degradation of polyorganosiloxanes was investigated in the presence of different catalysts, such as KOH, CH_3COOK, CH_3COONH_4, H_2SO_4, tin diethyldicaprylate and polyethylaluminosiloxane. The resin $(CH_3)(C_6H_5)_2(SiO_{3/2})_3$ had an average molecular weight of about 900 and contained about 2% reactive groups (OH, etc.). The effect of the type and concentration of catalyst on the content of organic groups in the polyorganosiloxane was investigated after thermo-oxidative degradation at 400C for 220 hours by determining the weight loss of the sample. The experimental data are plotted and tabulated. The carbon content and

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L 35470-65
ACCESSION NR: AP4046896

2

the C_6H_5:Si ratio were calculated, and for some samples the microelemental analysis of the H/C ratio was also carried out. It was found that the thermo-oxidative degradation of the resin without a catalyst leads to weight loss exceeding even the theoretically possible losses obtained by the combustion of the entire organic part of the resin. The process of degradation is accelerated considerably by potassium hydroxide and acetate. The data obtained with inorganic catalysts tin diethyldicaprylate and organosilicon compounds are plotted and discussed in detail. Interesting results were obtained with tin compounds. The addition of tin diethylcaprylate to polyorganosiloxane and other polymers improved their thermal stability and also accelerated hardening. Tin diethylcaprylate is most suitable when added in 20% tetraethoxysilane solution. The effect of tetraethoxysilane and tetramethoxysilane on the thermal degradation was also investigated by weight loss. The weight loss data at 400C show that their addition affects the thermo-oxidative degradation to a certain extent. Hydroxides and salts of alkali metals are very dangerous agents because they accelerate the oxidation of the polymer. The mechanism of action of these catalysts has not yet been clarified, but the experimental data show that the purity of the polyorganosiloxane has a significant effect on their activity at high temperatures.

Card 2/3

L 35470-65

ACCESSION NR: AP4046896

In order to study the final state of the resin after thermal degradation, infrared absorption spectra were taken before and after heating at 400C for 220 hrs. The most interesting bands were produced by the oscillation of the main polymer skeleton Si-O-Si. In the region of the valency oscillation of SiO at about 1100 cm^{-1}, in the spectra of both the initial resin and that hardened at 270C, two intensive bands appear with maxima at about 1050 and 1180 cm^{-1}. The different bands are compared with bands obtained for quartz glass and interpreted. Orig. art. has: 1 table and 2 figures.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 008 OTHER: 007

Card 3/3

SPITSYN, Vikt.I., akademik; KOROLEV, A. Ya.; KULESHOV, I.M.; VINOGRADOVA, L.N. Prinimala uchastiye ARTAMONOVA, R.V.

Process of polishing aluminum studied by the radioactive tracer technique. Dokl. AN SSSR 159 no.4:865-868 D '64 (MIRA 18:1)

1. Institut fizicheskoy khimii AN SSSR.

L 23640-65 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(v)/EPR/EWP(j)/T/EWP(b) Pc-4/Pq-4/
Pr-4/Ps-4 RM/WH/WW

ACCESSION NR: AP5002827 S/0191/65/000/001/0036/0040

AUTHOR: Zhordev, Yu. V.; Korolev, A. Ya.

TITLE: The destruction of glass fibers during thermal aging of glass plastic with an organosilicon binder

SOURCE: Plasticheskiye massy, no. 1, 1965, 36-40

TOPIC TAGS: glass plastic, glass fiber, thermal aging, silicoorganic binder, polymer aging, polysiloxane resin, borosilicate fiber, glass plastic mechanical property

ABSTRACT: The destruction of glass fibers by the stresses developed in the surrounding siloxane resin during curing, molding and thermal aging was studied by microscopic and electron microscopic photography of the advancing defects. A composition of low-alkali borosilicate fiber with a thermally stable, thermosetting polyphenylmethylsiloxane resin of the general formula $CH_3(C_6H_5)_2(SiO_{1.5})_3$ was cured, pressed, and thermally aged at temperatures up to 300C for up to 300 hrs. The resin shrank during curing and liberated water. Developing defects were particularly perceptible after etching with hot 10% aqueous KOH. Five hours of heating at 200C, as needed for the complete curing of the resin, did not cause visible defects, but incipient destruction was observed after 5 hrs. heating at 300C or after pressing. Defects increased with time from low angle cracks

Card 1/2

L 23640-65

ACCESSION NR: AP5002827

(with respect to the fiber axis) to the start of transverse cracking after 50 hrs at 300C and to almost complete destruction of the fiber structure after 300 hrs at 300C or 200 hrs at 400C. The average fiber length decreased to a magnitude of 3-6 fiber diameters. Similar thermal aging of glass fibers without binder did not cause destruction of the fibers. Thus, the decrease in mechanical strength of thermally aged glass fiber-filled silicon resins and other thermosetting materials is caused by the decomposition of both resin and fiber. Orig. art. has: 9 photomicrographs.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

NO REF SOV: 008 OTHER: 010

2/2

Card

L 54777-65 EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4/Pt-7 WW/RM

ACCESSION NR: AP5014521 UR/0069/65/027/003/0320/0325
541.183

AUTHOR: Borisova, F. K.; Galkin, G. A.; Kiselev, A. V.; Korolev, A. Ya.; Lygin, V. I.

TITLE: Infrared study of the nature of the active adhesion layer on the surface of polytetrafluoroethylene

SOURCE: Kolloidnyy zhurnal, v. 27, no. 3, 1965, 320-325

TOPIC TAGS: polytetrafluoroethylene, surface property, surface treatment, polymer, fluoropolymer, ir spectrum

ABSTRACT: The IR spectra of surface compounds based on polytetrafluoroethylene modified by different methods were studied using polymer films. Modification of the film by three different methods (in sodium naphthalene complex, in liquid ammonia solution of metallic sodium and in molten potassium acetate) produced hydrophobization of the surface and improved the adhesive properties of the polymer. Infrared spectra were studied in surface compounds based on multilayer polymer films before and after modification. Conjugated double bonds were found in the surface

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L 37691-65 EPR/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t) Ps-4/Pab DIAAP/IJP(c)
MJW/JD

ACCESSION NR: AP5000917 S/0020/64/159/004/0865/0868

AUTHOR: Spitsyn, V. I. (Academician); Korolev, A. Ya.; Kuleshov, I. M.; Vinogradova, L. M.

TITLE: Investigation of the aluminum polishing process by the radioactive tracer method

SOURCE: AN SSSR. Doklady, v. 159, no. 4, 1964, 865-868

TOPIC TAGS: aluminum polishing, mechanism, kinetics, stearic acid, stearic acid chemosorption, Duralumin

ABSTRACT: The action of stearic acid in aluminum polishing was studied by polishing Duralumin D16-ATV with a paste of chromic oxide and stearic acid in which the carboxyl group was tagged with C-14. Extraction of the polished metal with benzene for 1 hour reduced the radioactivity of the surface to a level which then remained essentially constant, even after prolonged extraction with other organic solvents. Boiling in water rapidly reduced the radioactivity to a constant value which indicated 28% of the stearic acid did not undergo hydrolysis. Calculations showed that one stearic acid molecule was chemosorbed for 4 surface

Card 1/2

KOROLEV, B., inzh.

Reorganizing the training of specialists for grain procurement stations and enterprises of the Ministry of Cereal Products of the R.S.F.S.R. Muk.-elev.prom. 25 no.7:24-25 Jl '59.
(MIRA 12:11)

1. Upravleniye kadrov i uchebnykh zavedeniy Ministerstva khleboproduktov RSFSR.
(Grain milling) (Grain elevators)

Korolev B

GERASIMOVICH, M.; KOROLEV, B.

International exhibition of photographic and motion-picture engineering. Sov.foto 17 no.1:49-50 Ja '57. (MLRA 10:7)
(Cologne--Cameras--Exhibitions)

KOROLEV, B.

Training mechanics for the neterprises of the All-Russian Grain Products Association. Muk.-elev.prom. 30 no.1:25-27 Ja '64. (MIRA 17:3)

1. Starshiy inzh.-metodist Upravleniya kadrov i uchebnykh zavedeniy Vserossiyskogo ob"yedineniya khleboproduktov.

KOROLEV, B.A.

For high production standards. Zemledelie 26 no.6:8-11 Je '64. (MIRA 17:8)

1. Direktor sovkhoza "Mar'ino", Ryl'skogo rayona, Kurskoy oblasti.

KOROLEV, B. A.

"Esophagogastrostomy Through the Abdominal Tract During a Cardiospasm," Khirurgiya, No.4, 1948

Gor'kiy

2337. **Results of transpleural resections of oesophagus and cardia with various operative procedures (Russian text)** KOROLEV B. A. Gorky *Trudy VI Plenuma Pravl. Vses. Nauch. Obshch. Khir. (Leningrad, Noyabr 1956)* 1957 (88–93)

In the 1952–1956 period 116 radical operations were performed in cases with cancer of the cardia (14.5% fatal terminations) and 34 in cases with carcinoma of the oesophagus (26.4% fatal terminations). Combined resections were performed in 28.4% of the cases with cardial lesions. The author modified the transpleural gastrectomy technique, dividing the stomach at a distance of not less than 2 finger-breadths above the pylorus. This makes it possible to avoid the most difficult step dealing with the duodenal stump. Eighteen such operations were performed with one fatal termination. Also, 5 radical operations were performed for recurrence of cancer in the stump of a resected stomach. Resection of the thoracic portion of the oesophagus was performed from a left-sided approach. Supra-aortic anastomosis was applied in 23 patients with 6 fatal terminations; cervical oesophagogastrostomy was performed in one case. In cancer of the lower third of the oesophagus, removal of part of the cardia and the fundus ventriculi is recommended to enhance the radical nature of the procedure. For this same purpose in cases of high carcinomas of the oesophagus, the author, without resecting the stomach, removes part of the lesser omentum which adjoins the cardia. Kolesov – Leningrad

KOROLEV, B.A.

Surgery in mitral stenosis. [with summary in English] Eksp. khir. 2 no.1:14-19 Ja-F '57 (MLRA 10:4)

1. Iz gospital'noy khirurgicheskoy kliniki (zav.-prof. B.A. Korolev) Gor'kovskogo meditsinskogo instituta imeni S.M. Kirova (dir.-dotsent N.N. Mizinov) i bol'nitsy no.5 (glavnyy vrach - zasluzhennyy vrach RSFSR N.L. Pyatnitskiy)

(COMMISSUROTOMY
technic & compl. in mitral commissurotomy) (Rus)

Korolev, B.A.

KOROLEV, B.A.(Gor'kiy, ul. Sverdlova, d.9A, kv. 38)

Experience in surgical treatment of lung cancer [with summary in English]. Vop.onk. 3 no.5:596-599 '57. (MIRA 11:2)

1. Iz kafedry gospital'noy khirurgii Gor'kovskogo meditsinskogo instituta im. S.M.Kirova (dir. - dots. N.N.Mizinov)
(LUNG NEOPLASMS, surg.
follow-up)

KOROLEV, B.A.

KOROLEV, B.A.

Characteristics of pulmonary resection in tuberculosis [with summary in English]. Khirurgiia 33 no.4:61-65 Ap '57. (MLRA 10:7)

1. Iz kliniki gospital'noy khirurgii (zav. - prof. B.A.Korolev) Gor'kovskogo meditsinskogo instituta imeni S.M.Kirova (dir. - dotsent N.N.Mizinov) Gor'kovskogo oblastnogo tuberkuleznogo dispansera (glavnyy vrach - zasluzhennyy vrach RSFSR V.N.Drozdova)

(TUBERCULOSIS, PULMONARY, surg.
pneumonectomy)
(PNEUMONECTOMY, in various dis.
tuberc., pulm.)

BEREZOV, Ye.L.; KOZHEVNIKOV, A.I.; KOROLEV, B.A.; FEDOROV, A.F.

Activity of the Gor'kiy Surgical Society. Zdrav.Ros.Feder. 2 no. 6:45-57 Je '58. (MIRA 11:5)

1. Predsedatel' Gor'kovskogo khirurgicheskogo obshchestva (for Berezov). 2. Zamestitel' predsedatelya Gor'kovskogo khirurgicheskogo obshchestva (for Kozhevnikov, Korolev). 3. Otvetstvennyy sekretar' Gor'kovskogo khirurgicheskogo obshchestva (for Fedorov).
(GORKIY--SURGERY--SOCIETIES)

KOROLEV, B.A., prof.

Transpleural resections in cardio-esophageal carcinomas [with summary in English]. Khirurgiia 34 no.1:61-69 Ja '58. (MIRA 11:3)

1. Iz kafedry gospital'noy khirurgii (zav.-prof. B.A.Korolev) Gor'kovskogo meditsinskogo instituta imeni S.M.Kirova (dir.-dotsent N.N.Mizinov)

(STOMACH NEOPLASMS, surgery,
cardio-esophageal carcinoma, transpleural surg. (Rus)
(ESOPHAGUS, neoplasms,
same)

KOROLEV, B.A., MOROZOVA, A.P.

Intra-arterial blood transfusion during resection of the lung. [with summary in English] Khirurgiia 34 no.4:83-85 Ap '58 (MIRA 11:7)

1. Iz gospital'noy khirurgicheskoy kliniki (zav. - prof. B.A. Korolev) Gor'kovskogo meditsinskogo instituta (dir. - dots. N.N. Misinov).

(LUNGS, surgery
resection, intra-arterial blood transfusion in(Rus))
(BLOOD TRANSFUSION,
intra-arterial in resection of lungs (Rus))

KOROLEV, B.A., red.

[Surgery in mitral stenosis] Khirurgiia mitral'nogo stenoza. Gor'kii, Gor'kovskii gos.med.in-t im. S.M.Kirova, 1959. 146 p. (MIRA 13:7)

(MITRAL VALVE--SURGERY)

KOROLEV, B.A.

Commissurotomy in mitral stenosis. Grud.khir. 1 no.1:25-31 Ja-F '59. (MIRA 13:6)

1. Iz gospital'noy khirurgicheskoy kliniki Gor'kovskogo meditsinskogo instituta imeni S.M. Kirova.
(MITRAL VALVE--SURGERY)